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TOP OF THE NEWS

Some users of the IBM 3090 mainframe have saved as much as \$60,000 by retrofitting power supplies used with earlier processor models. **Page 35.**

The new version of Lifetree Software, Inc.'s popular Volkswriter word processing program includes mathematical functions. **Page 41.**

Pentagon officials continued the push for suppliers to provide documentation electronically. **Page 2.**

The field marshal for IBM's applications software strategy defended pricing policy and countered critics' charges. **Page 14.**

Ken Fisher's Encore Computer Corp. said it will dismiss part of its work force and fold some products. **Page 4.**

Apple Computer President John Sculley reportedly said last week that future Apple products will use the AT&T Unix operating system. Sculley made the comment when he was questioned by reporters outside a Silicon Valley forum, but the company refused to confirm that report. "It may or may not be true. I have no way of knowing," Apple spokeswoman Linda Merrill said. Anticipation is building for Apple's traditional product unveiling at its Jan. 24 stockholders meeting.

Insiders at AT&T Information Systems confirmed and further described a forthcoming IBM Personal Computer-compatible laptop computer, dubbed Safari 7. The device, which looks like a briefcase with a handle when the flip-up screen is closed, boasts a 9½-in. diagonal LCD screen said to be next-generation in clarity, resolution and contrast. The adjustable 25-line by 80-col. screen has 640 by 200 picture elements and can, through shading, simulate four colors. A user-installable LCD backlight option enables use in poorly lit areas. Safari 7 weighs 14 pounds without battery. See **NEWS** page 5

Wall Street snubs DBMS

By Charles Babcock

NEW YORK — The major players in the booming securities industry are relying on aging or outdated data management systems, according to a *Computerworld* survey of leading brokerage houses.

The typical brokerage environment today is a mixed one in which some tasks are allotted to a data base management system like Cullinet Software, Inc.'s IDMS, but heavy production processing remains in the hands of an older system, typically IBM's VSAM file management system. Even at securities industry leader Merrill Lynch & Co., which is converting to a central DBMS, the system of choice is IBM's IMS, first introduced in 1969.

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Microcom opens modem standard

Vendors choose up sides in network protocol fray

By Bob Wallace
Special to CW

NORWOOD, Mass. — Modem vendor Microcom, Inc. will move to turn the tide in the battle of the network protocols when it releases a large portion of its popular asynchronous error checking protocol into the public domain tomorrow.

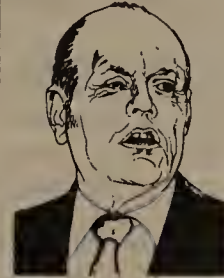
The Microcom Networking Protocol, which the firm has been developing and promoting for the past 2½ years, is a method of catching and correcting errors in data transmitted between modems. Both MNP and X.PC, a similar protocol backed

See **MICROCOM** page 10

DEC clusters 8650 against mainframes

By James Connolly

MARLBORO, Mass. — Taking aim at the IBM mainframe world, Digital Equipment Corp. last week announced a supermini-computer designed to better its VAX 8600's speed by 44% and, when clustered, to match the performance of IBM's largest systems.



DEC's Olsen

In introducing the VAX 8650, DEC President Kenneth H. Olsen essentially dismissed other superminicomputer vendors as serious DEC competitors. These rivals, Olsen contended, sell slower processors and fail to offer the networking and software compatibility provided in DEC's VAX line.

The 8650 was announced only two weeks after DEC's traditional rival, Data General Corp., bettered DEC's previous high-end machine [CW, Nov. 25]. The DG Eclipse MV/20000 supermini features an estimated performance of 5.5 million instructions per second, topping DEC's VAX 8600, with its 4.4-MIPS performance. While the 8650 features an estimated 6.8 MIPS, its \$475,000 price tag is twice that of the MV/20000. Additionally, DG offered a dyadic MV/20000 with a claimed performance of 10 MIPS at a cost of \$337,000.

Olsen surveyed the supermini battlefield at last week's press conference and commented, "It appears to me that we are the only ones who can offer a full network. We offer complete services for networking. The products are here now and available now."

One DEC official, noting that DEC encounters IBM more than any other vendor in competitive situations, said a cluster of eight 8650s will provide more power than

See **DEC** page 6

CW EXCLUSIVE

Short order: Denny's scrambles disaster team

By Jeffrey Beeler

LA MIRADA, Calif. — A major restaurant chain recently simulated the total destruction of its only corporate data center and successfully completed the first unannounced test of its disaster recovery plan.

Less than 20 hours after reporting the facility "destroyed" in an imaginary fire, Denny's, Inc. had dispatched eight specially trained employees to Dallas and had reactivated its key systems capabilities in a commercial backup data center.

None of the eight participants, whose involvement in the recovery effort began

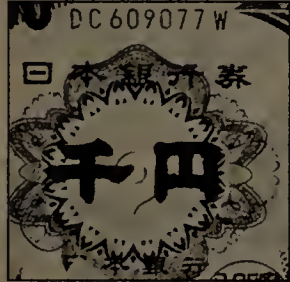
with a series of phone calls that roused them from bed at 3 a.m., knew ahead of time precisely when the drill would take place. The only Denny's employees who were notified in advance of the Nov. 19 exercise were the company's internal audit staff and its vice-president of information services, Richard Kislowksi. "As far as I can tell, it was a surprise to everyone else," according to Evan Ride, Denny's director of computing.

Last month's drill was not the first time that the nationwide restaurant chain had tested the contents of its 400-page disaster recovery manual. Since 1983, Denny's has conducted two such

tests each year, one in the spring and the other in the fall. With each succeeding exercise, the firm has introduced an added measure of realism and difficulty as its experience in disaster recovery matters has steadily grown.

But until Nov. 19, Denny's had always carefully forewarned its recovery team members of the next simulated disaster and had even furnished them with exact dates and times. Last April, for example, the group was mustered hastily on a Saturday and plotted its strategy in detail before departing a day later for Dallas and beginning its recovery drill in

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NEWS

Pentagon pushes for standards

Urges development of text, graphics exchange formats

By Mitch Betts

WASHINGTON, D.C. — Taking a cue from General Motors Corp.'s push to persuade suppliers to use its Manufacturing Automation Protocol (MAP), the U.S. Department of Defense is urging weapons manufacturers to agree on integrated text and graphics exchange standards, Pentagon officials said last week.

The Pentagon's goal is to establish standards so that the technical documents and drawings now delivered in paper form to the military will instead be sent electronically to a digital data base.

At the third annual Defense and Government Computer Graphics Conference, Pentagon officials provided new details about ambitious plans to have defense contractors use their computer-aided design and manufacturing systems to provide the military with on-line repair manuals [CW, Sept. 16]. The program is called Computer-Aided Logistic Support (CALS).

Bruce A. Lepisto, project officer for the Pentagon's Weapons Support Improvement Group, said the department will use its leverage to accelerate the development of text and graphics exchange standards. By 1990, the department expects to be able to require in the contract that contractors

transmit technical manuals and drawings for major new weapons systems in digital form, he said.

"Industry architectures are evolving rapidly without DOD interface standards," Lepisto said, "so DOD has decided to drive a stake in the ground and support a set of standards."

DOD to pursue data exchange standards

According to a Sept. 24 memo from Deputy Defense Secretary William H. Taft IV, the DOD will pursue interim and long-term data exchange standards at the same time. The U.S. Air Force has immediately taken the lead to define an interim data exchange standard, including the Initial Graphics Exchange Specification/Product Definition Exchange Specification for graphics and the Standard Generalized Markup Language for text.

These standards are not sufficient, however, because they do not permit the mixing of text and graphics, Lepisto said. The Defense Material Specifications and Standards Office and the National Bureau of Standards will lead the effort to develop more integrated standards, he said.

Russell R. Shorey, director of the Weapons Support Improvement Group, said the CALS program began about two years ago when defense contractors, who were increasing their investments in computer-aided design and manufacturing, warned the DOD that it was being left behind.

Harvard, IBM train MIS faculty

By Eddy Goldberg

BOSTON — The Harvard Business School has teamed up with IBM in a project to produce top-level faculty for teaching positions in the MIS field.

The purpose of the \$2 million, four-year joint project announced last week is to overcome the present shortage of qualified MIS faculty and to increase leading-edge research in MIS.

"One thing we've been worried about is the lack of faculty to fill several hundred teaching positions across the country," said Prof. F. Warren McFarlan, who is coordinating the project at Harvard. McFarlan said that many computer courses at colleges and universities are being closed out because of the teacher shortfall. He views the problem as a long-term phenomenon and sees a continuing need for expanding the program.

Program to train mid-career executives

In addition to bringing students up through the school's three-year doctoral program in information systems, the project also will offer a 16-month program to train mid-career executives. "We're looking for people with successful careers in the information field, from MIS departments or software research groups, for ex-

ample, who have reached a point where they'd like to take a shot at a university teaching position," McFarlan said.

He added that even the best universities have difficulty recruiting high-quality faculty in the information systems field, citing Stanford University in California as an example.

According to McFarlan, Stanford, unable to recruit satisfactory instructors, has no information systems faculty at its business school.

The joint project, which began this fall, is scheduled to last through the 1988-1989 academic year. After that, the Harvard Business School will continue the program on its own. McFarlan views the \$1 million from IBM as "bridge financing to develop the program to get to a steady state of eight to 10 graduates each year."

There are now eight students in the information systems doctoral program. Only two are scheduled to complete their dissertations this academic year, and only four were admitted this past fall. McFarlan said that plans are to admit five or six doctoral students next year and to accept the first two executives for the 16-month Program for Future Faculty. By 1988-1989, he said he hopes to see eight to 10 entrants every year.

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NEWS

Encore trims work force, product line

By Donna Raimondi

MARLBORO, Mass. — Encore Computer Corp. will lay off one-sixth of its work force over the next few weeks and eliminate some products by the end of January, the company said last week.

The superminicomputer start-up, founded by former Prime Computer, Inc. President Kenneth G. Fisher and top executives of Data General Corp. and Digital Equipment Corp., will dismiss 40 employees out of a total of 240.

The 2-year-old company said it intends to trim its line of workstations and focus resources on its flagship product, the Multimax superminicomputer, according to spokesman Charles Casale. But he said the company has a strong cash position with \$24 million in reserves.

"If there is still money available to them, they will be a lot better off after the reorganization," said analyst George Colony, president of Forrester Research, Inc. in Cambridge, Mass. Encore has been plagued by too many top-level people with too many different ideas about where the company should go, he added.

The company's stellar management team was headed by founders Fisher, who is chairman; C. Gordon Bell, a former vice-president of engineering at DEC; and Henry Burkhardt, a founder of DG.

However, in recent months, there has been a steady stream of resignations among middle- and top-level executives, including Burkhardt and Vice-President Robert Puffer, along with a half dozen others.

James Pompa, president and chief operating officer of Encore since the beginning of November, has led the reshuffling.

The company will eliminate the entry-level Hoststation 100 terminal and the top-of-the-line \$14,000 Hoststation 550 but will continue to offer the \$3,800 Hoststation 110, Casale said.

The company said it has shipped one Multimax, which is not yet installed.

U.S. moves on chip dumping

Government files case against foreign vendors

By Clinton Wilder

The Reagan administration dramatically shifted its stance in the international semiconductor industry trade conflict last week, affirming a charge of Japanese chip dumping and preparing to file its own predatory pricing charges against Japanese vendors.

A cabinet-level Economic Policy Group is expected this week to file the first government-initiated case charging Japanese vendors with dumping, or selling below production cost in the U.S., 256K-byte dynamic random-access memory (RAM) chips. In a preliminary ruling last week, the U.S. Department of Commerce took the first step toward imposing duties on Japanese-made 64K-byte dynamic RAM chips with a favorable ruling on antidumping charges filed by Micron Technology, Inc. of Boise, Idaho.

The Commerce Department said last week it had not received recommendations on the 256K-byte chip dispute, but U.S. Trade Representative Clayton Yeutter was quoted as saying an announcement was expected within days.

The San Jose, Calif.-based Semiconductor Industry Association (SIA) acknowledged the upcoming government action and praised the effort. "The proliferation of such cases is an indication that there is widespread abuse of the U.S. dumping laws, which were originally created to protect free and open trade," according to SIA spokeswoman Sheila Sandow. The SIA has officially petitioned for more open chip markets in Japan.

While industry observers conceded that protectionist action in the 64K-byte dynamic RAM market will come too late to help beleaguered U.S. manufacturers, the overall effect of a more aggressive government stance could influence future Japanese corporate behavior.

"There won't be much immediate effect on the market," said Howard Bogert, a vice-president of Dataquest, Inc. in San Jose, Calif. "More important is the psychological effect. I think the Japanese government and businessmen will weigh [the Commerce Department action] as a very

important sign of U.S. thinking and modify their future behavior."

Micron Technology, one of the few U.S. firms with a major stake in the low-end memory chip market, hailed the Commerce Department's favorable ruling. "It would seem to indicate that the Japanese are not the low-cost producers that they would like us to believe," said Micron attorney Lawrence Grant, referring to Micron's allegations that Japanese chips are sold well below cost.

The Commerce Department ruling required the Japanese firms cited by Micron to post bonds of various amounts on 64K-byte dynamic RAM chips that they export to the U.S. Based on pricing information it received from the companies, the department required a bond of 94% of the chip price to be posted by Mitsubishi Corp., 18% by Hitachi Ltd., 13% by Oki Electric Industry Co., 8.9% by NEC Corp. and an average of 38.8% by other companies. A source said Mitsubishi's higher penalty resulted from the firm's failure to provide complete pricing information in the investigation.

The Commerce Department is expected to make its final ruling by Feb. 14. If that confirms the preliminary decision, the case will go before the U.S. International Trade Commission (ITC) for consideration of punitive tariffs against the Japanese vendors. The ITC decision, due by March 31, could require the accused firms to forfeit all or a portion of the bonds posted on chips exported starting last week.

Micron and Texas Instruments, Inc. would be the primary U.S. firms directly affected by such penalties, which could result in higher Japanese 64K-byte dynamic RAM prices. A spokesman for TI refused to comment on the Micron case.

EPROM chip case

A decision is also expected early next year in an antidumping case filed by three California makers of erasable programmable read-only memory (EPROM) chips. "We are pleased with the Micron decision, and we hope all goes well with the EPROM case we filed," said a spokesman for Advanced Micro Devices, Inc. Advanced Micro Devices, Intel Corp. and National Semiconductor Corp. have filed the EPROM case, charging dumping by some of the same Japanese companies named in the 64K-byte dynamic RAM suit.

Separately, three of Japan's leading chip vendors said they have delayed or are reconsidering plans to expand their chip production facilities in the U.S. The delays will affect proposed plants to be built by Toshiba Corp. in California, Hitachi in Texas and Fujitsu Ltd. in Oregon.

In a related development, NEC announced a 20% price increase on its 64K-byte and 256K-byte dynamic RAM chips, a move greeted with skepticism in the U.S. "It's like a move in judo, where the object is to use your opponent's momentum to make him fall on his face," Dataquest's Bogert said. "Now that the U.S. has essentially conceded that market, why not raise the price?"

Computerworld West Coast Correspondent Maura McEnaney and Asia Bureau Chief Takehisa Kondoh contributed to this report.

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NEWS

Amdahl hikes high-end disk drive capacity

By James Connolly

SUNNYVALE, Calif. — Amdahl Corp., seeking to serve its own line of mainframes and to answer IBM's high-end disk drive additions, last week doubled the capacity of the Amdahl 6380 series of drives.

The 6380 Models AE4 and BE4 are intended to address the storage needs of existing Amdahl mainframes, other IBM-compatible mainframes and the high-end Amdahl 5890 series of processors announced in October and scheduled for delivery in 1986 and 1987. The storage systems were designed to be compatible with the 5.04G-byte IBM 3380 Model E disk drives announced in February.

Amdahl officials said the new 6380 models double the capacity of previous 6380 models to 5.04G bytes while continuing to use Amdahl's sealed disk enclosure technology, high-density packaging and the same floor space as earlier 6380s.

The AE4 string controller reportedly can be attached to the current Amdahl 6880 Model G2 or G2E control units. In addition, the string controllers can be intermixed with new BE4 or existing 6380 Model M4 or 6380 Model B4 models.

An AE4 costs \$104,110, and a BE4 costs \$78,510. Upgrades from the 6380 Model AA4 to the AE4 and the B4 to the BE4 cost \$40,000. The M4 single-capacity model can be upgraded to the B4 for \$9,750. A typical 20G-byte configuration, consisting of a G2 controller, an AE4 and three BE4s, costs \$398,610 plus a monthly maintenance charge of \$1,143.

E models will be available in the fourth quarter of 1986 and field upgrades in the first quarter of 1987.

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series and measures 16 inches across, 3½ inches high and 13½ inches deep. Features include two Harris 80C88 microprocessors; 256K-byte random-access memory, expandable to 1M byte; a 360K-byte so-called Silicon Disk; and a 360K-byte 5¼-in. floppy disk drive. A 10M-byte hard disk drive is optional. Safari 7 may be announced in a month or two, sources said.

The microcomputer software industry's largest acquisition deal was completed last week as Ashton-Tate purchased Multimate International Corp. Ashton-Tate claims that the move makes it the world's second largest independent micro applications software vendor, with outsiders estimating that total revenues will exceed \$140 million. The final purchase price was about \$22 million in cash, up from the \$19 million stock and cash combination outlined when the deal was announced last summer. No immediate changes are foreseen in Multimate products or distribution.

Elxsi expands System 6400 multiprocessor

Twelve-CPU model designed for Gigabus

By James Connolly

SAN JOSE, Calif. — Elxsi, a recently acquired subsidiary of Trilogy Ltd., is scheduled to announce expansion of its System 6400 multiprocessor with the addition of two processors to the existing 10-processor maximum configuration today.

The expansion is said to be designed to take better advantage of Elxsi's Gigabus 320M-byte/sec. system bus. A company spokesman said the enhanced system performs 72 million Whetstone instructions per

second, compared with 60 million Whetstones in the earlier maximum configuration.

Elxsi, which introduced the parallel processing System 6400, was acquired by Trilogy in October and plans to build future products using integrated circuit packaging and other technology developed by Trilogy during the parent company's attempts to build wafer-scale circuits.

Elxsi reportedly modified its message-based EMBOS operating system to handle the additional processors in the expanded System 6400. The System 6400 also was designed to run AT&T Unix System V and University of California at Berkeley Unix 4.3.

Each of the 12 processors includes

three boards utilizing emitter-coupled logic and large-scale integration proprietary gate arrays. The system reportedly features up to 4G bytes of virtual address space per processor and a central computer memory of up to 192M bytes.

The 12-CPU system is housed in two cabinets, each 32 inches deep and 59 inches wide.

Elxsi officials said the System 6400's performance is comparable to that of a Cray Research, Inc. Cray-1S supercomputer in many applications such as circuit design, aerospace research and seismic simulation.

Available during the first quarter of 1986, a fully configured System 6400 costs \$3 million.



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NEWS

Ada 'Software Valley' in West Virginia

By Mitch Betts

WASHINGTON, D.C. — U.S. Sen. Robert C. Byrd (D-W.Va.) and West Virginia University have teamed up in an ambitious effort to create a "Software Valley" in their state, hoping to lure software development firms specializing in the Ada language to West Virginia.

According to Byrd and his aides, the focal point for the economic development effort will be Software Valley Corp., a nonprofit information clearinghouse for West Virginia high-tech firms that was created earlier this year. It is expected to help the growing coalition of businesses and institutions to share Ada technology, train Ada software engineers and attract high-tech firms to West Virginia.

"The first goal of Software Valley is to assist its members to take part in the total market for Ada software, which is expected to exceed \$20 billion annually by 1990," Byrd said at a Software Valley conference held in Morgantown, W. Va., on Nov. 25.

The Software Valley envisioned by the volunteer sponsors would stretch along Interstate 79 from north central West Virginia to the U.S. Department of Defense's Software Engineering Institute in Pittsburgh.

Byrd said one goal is to alleviate the nationwide shortage of Ada software engineers through training programs.

"Ada training will offer West Virginia an opportunity to become the first region that is nationally recognized for Ada software engineering excellence," he said.

To that end, EVB Software Engineering, Inc. of Rockville, Md.; Intermetrics, Inc. of Westboro, Mass.; and Magnavox Electronic Systems Co. of Fort Wayne, Ind., are donating Ada training courses. Verdix Corp. of Chantilly, Va., and System Designer Software, Inc. of Woburn, Mass., are donating Ada software to the university.

In addition to the training courses, the nascent Software Valley Corp. established an electronic bulletin board for information exchange, said it plans a network link from the National Aeronautics and Space Administration's technical archives to the university and established ties to the state's venture capital community.

'Incubator' building possible

Also, the sponsors are seeking state economic development funds to build a Software Valley "incubator" building for start-up companies, according to Byrd's aides.

The aides said that about 250 people attended the Nov. 25 conference, which featured an announcement by Cray Research, Inc. of Minneapolis: Cray said it wants to obtain or develop an Ada compiler for use on its supercomputers.

Byrd said that another specific goal of the Software Valley movement is to transfer the research of the Software Engineering Institute to the commercial marketplace.

DEC clusters 8650, CPUs

From page 1

the IBM 3090 Model 400 quadratic processor scheduled for delivery in 1986.

The 8650 features a cycle time of 55 nsec, a 44% improvement over the 80-nsec speed of the year-old 8600, and executes various benchmarks about 45% faster than does the 8600, DEC said.

The 8650 supports 250 users in a typical office situation, according to officials.

In connection with the emphasis on clustering up to 15 VAX machines, DEC also announced enhancements to several of its software packages. These include an enhanced version of VAX DBMS V3.0, a Codasyl-compliant data base management system that now allows operation in a VAX cluster environment and access to remote data bases through DEC's Decnet networking software.

DEC's relational data base management system, VAX RDB/VMS V2.0, was enhanced to allow any RDB-equipped node on a VAX network to access transparently RDB data bases running on any other node.

DEC also announced VAX ACMS V2.0, which was designed to provide distributed transaction capabilities in Vaxclusters and networks. The latest version reportedly allows use of a menu to move applications among nodes with ACMS searching for available nodes.

Other announcements included the following:

- VAX Common Data Dictionary V3.2, a version that supports DEC's VAX RPG-II and 8-bit characters, so full international character sets can be used on the company's VT200 terminals.

- VAX Datatrieve V3.3, a version of a data storage and retrieval system allowing support for the VAX RDB/VMS segmented string data type throughout the RDB interface, and support for logical names in user-defined tables.

- VAX TDMS V1.5, terminal data management software that enables programmers to design forms and interactions between programs and terminals or between users for use with application programs.

- Vaxinfo I, II and III, packages of the enhanced software priced at 10% to 25% below the cost of individual pieces of software.

- Vaxset and VNXset, integrated packages of software engineering tools featuring 25% discounts from individual licensing costs.

The 8650, which will be available in 90 days, costs \$475,000 with 4M bytes of main memory, two Unibus I/O adapters, a disk controller and a VMS operating system license. A similar system configured for use in a cluster costs \$526,000.

A field upgrade package designed to convert an 8600 into an 8650 will be available in April for \$125,000, the company said.

DEC officials said developing the 8650 involved changes to seven of the 17 CPU boards in the 8600.

Most of the gains in performance were achieved through improvements in gate array design and in surface mount technology that allows packing more chips on a board, ac-

Digital Equipment Corp.

System Characteristic	VAX-11/780	VAX-11/782	VAX-11/785	VAX 8600	VAX 8650
MIPS ¹	1.06	1.9	1.7	4.4	6.8
Memory Size in Bytes	1M-64M	4M-8M	2M-64M	4M-32M	4M-68M
Purchase Price ² (Memory Size)	\$145,000 (2M)	\$320,000 (4M)	\$195,000 (2M)	\$350,000 (4M)	\$475,000 (4M)
Machine Cycle Time (Nsec)	290	290	166	80	55
Channels	1-8	1-8	1-8	1-12	1-12
Cache (Buffer) Size in Bytes	8K	16K	32K	16K	16K
Price per Extra Megabyte of Memory	\$4,500	\$4,500	\$4,500	\$4,000	\$4,000

1. Million Instructions per second.

2. For basic configuration, including CPU and DEC's VMS license.

CW Chart

Specifications for the high end of Digital Equipment Corp.'s VAX line.

cording to the company.

For example, the new memory subsystem holds one 16M-byte board in the space formerly needed for two 4M-byte boards. The maximum main memory of 68M bytes can be achieved through four 16M-byte boards and one 4M-byte board.

The 8650 runs VMS and DEC's Ultrix-32 version of AT&T Unix. A fully configured system reportedly addresses 4G bytes of virtual memory, manages 160G bytes of on-line storage and allows 512 direct communications lines.

DEC officials said that more than 1,000 8600 systems have been installed since deliveries began in February and that the 8600 will remain available for customers who do not need the power of an 8650.

DEC watchers: 8650 no surprise

By Donna Raimondi

The machine Digital Equipment Corp. introduced last week to push into the big systems market was no surprise to DEC watchers.

The capabilities in the VAX 8650 were inherent in the VAX 8600 model, announced a year ago. The progression from the VAX 8600 to the VAX 8650 reminded DEC users and analysts of the progression DEC made from the VAX-11/780 to the VAX-11/785. One difference, according to Craig Symonds, an analyst with Gartner Securities Corp., is that there was a six-year wait for the VAX-11/785 but only a one-year wait for the VAX 8650.

The system is basically a redesigned version of the VAX 8600. "Clearly, this product had been planned and under development for a while," Symonds said.

Several analysts viewed the 8650 as most valuable to the installed base of DEC users. One such user, Mary Jo Moccia, vice-president of DP services at the Midwest Stock Exchange in Chicago, underscored that observation. "We will upgrade to the 8650 to increase our capabilities," she said. Moccia operates a Vaxcluster with two VAX 8600s and four VAX-11/785s. "We have about 145 to 160 devices on the VAXs," she said, "and we process a half million records each day, so anything that expands that capability is a great advantage to us."

The Midwest Stock Exchange is buying the upgrade sight unseen, Moccia said. "I haven't used it yet, but I am assuming it will do what they are saying. It's a field upgrade, the same as the 780 to 785 was. When we did that upgrade, there was no effort and no effect on the software."

With DEC's emphasis on clustering 8650s, it is difficult to understand what the market for the product is, according to Symonds. "We are talking about a mini with the performance of a mainframe," he said.

Breaking into the mainframe market will require time and effort on DEC's part, Symonds said. "I think the VAX formation with clusters is clearly positioned to do that," he added. "The question is, do MIS managers believe it, and if they do, can they take the risk?"

Although the 8650 can be classified as a big system, it will probably not make a dent in the traditional big mainframe market, said Richard Mikita, an analyst with International Data Corp. in Framingham, Mass. DEC would have to convince people to switch software, Mikita said, and the IBM users are not likely to do that. The 8650's value is in the capacity it gives to clustering, he said.

According to Myron Kerstetter, program director of small computer systems at the Gartner Group, Inc. the 8650 may appeal to Decsystem-10 and Decsystem-20 users who were angered by DEC's decision not to develop next-generation products for that line. Additionally, it will blunt competition from a flood of products from start-up companies that have targeted the mid-size range.

The real news in DEC's announcement is in the software enhancements, which allow DEC's data bases to be accessed by any user on any node. A truly distributed data base gives DEC tremendous competitive advantage in selling its system, Symonds stated.

Kerstetter agreed. "The cluster was kind of crippled without that capability," he said. The data base access enhancements give the clustered system the image of a single system. It allows users to apply the total processing power of the cluster to a particular transaction processing load, he added.

IBM's response to the fact that 80% of data is generated outside the central mainframe complex has been to gather up that information and load it up on the central CPU, Symonds said. But it is more cost-effective to build a distributed solution to the software, like DEC has now done, he added.

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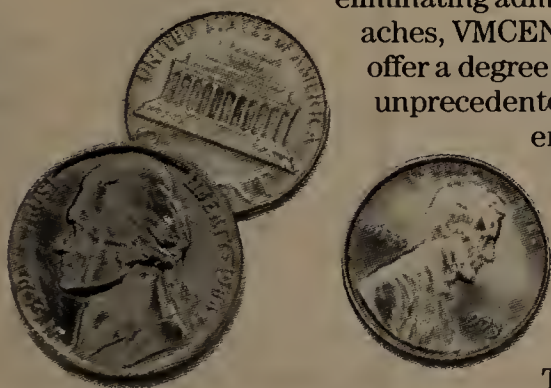
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NEWS

Success limited in offshore programming

Shanghai Software micro applications gaining acceptance

By Edward Warner
Computerworld News Service

SAN FRANCISCO (CWN) — In the early 1980s, the buzzword was "offshore manufacturing," as computer companies like Atari, Inc. transferred their manufacturing operations to Asian nations where labor costs were lower.

Inspired by the manufacturers, Roderick MacLeod has been working for nearly as long to make offshore programming just as well accepted, so far with limited success. Although MacLeod's San Francisco firm, Shanghai Software Consortium, has about 30 top Chinese programmers working for it — in Shanghai — MacLeod said that he has found Americans still perceive the Chinese as technologically unsophisticated, a misperception that nonetheless scared off potential customers.

Since its founding in 1981, Shanghai Software has done little of what MacLeod calls offshore programming, under which the Chinese programming team contracts directly with a vendor to write a software package. Instead, the programmers have been writing for Shanghai Software itself, producing mostly microcomputer applications that are in turn sold by Shanghai Software to software vendors with retail distribution systems. While the Chinese programmers did help produce a custom loan analysis package for Gibraltar Finance, a California savings and loan association, a more typical product is Creative Count, an IBM Personal Computer spreadsheet that is now owned and marketed by Activision.

Shanghai Software, of which MacLeod is president, is not the only U.S. firm hoping to make a name in off-

shore programming. Another Northern California company, Pleasant Valley Software Corp., is said to have a team of programmers in India available for contract programming. One U.S. software firm, Texas-based DAC Software, Inc., has much of the programming for its microcomputer software done in Mexico.

But, according to analyst Damian Rinaldi of Framingham, Mass.-based International Data Corp., the lure of

”

American programmers too often develop a prima donna complex, something not encouraged by the Chinese culture.

low-cost programmers has yet to overcome the need for personal interaction between programmers and end users. "Nine thousand miles away," Rinaldi said, "is still 9,000 miles away" no matter what the savings.

MacLeod said his employees are among the top programmers in China, working at the institutes and universities where China's computer development effort is based. During lulls in their work, the programmers contract to write for Shanghai Software. They work in teams at one location under the supervision of an American manager.

While the Chinese programmers work for less pay than American programmers, MacLeod said, their greatest strength is their consistently high quality and reliability. American programmers, he added, too often develop a prima donna complex, something that is not encouraged by the

Chinese culture.

Shanghai Software's great leap into Chinese-written applications software did not occur effortlessly. A minimum eight-hour time difference exists between San Francisco and China, making telephone contact between Shanghai Software and the development team almost impossible. Instead, Telex messages are used for communication, but a day's delay often arises between the time the message was sent and when it was received.

Ultimately, MacLeod said, the messages have become a way for each side to clarify its thoughts.

Also to be overcome, MacLeod said, was each side's assumption that it had the best approach to problem solving. A typical instance, he explained, is the differing approach Chinese and American programmers take to debugging. American programmers, MacLeod said, will step aside during debugging to let the debugging expert work things out. As for the Chinese, he said, "Everybody gets together and does it in a group, ... but it gets things done."

MacLeod said he has since learned that the U.S. way "isn't always the best way."

A bigger cultural problem looms, however, one that Asian nations from Japan to Taiwan are now wrestling with as well. How do you stimulate individual creative effort, MacLeod asked, among programmers who are socialized toward group-oriented values? "There does seem to be something in the social environment — the experts have said the Chinese are more group oriented — that makes [the Chinese] more interested in perfecting an existing product," he observed.

Creativity aside, MacLeod said, the long association of the Chinese with the world's first calculating machine — the abacus — has made them "naturals at computer programming."



WORLD DIGEST
Computerworld
News Service



ROME — Two months after the partial privatization of Italy's state-owned telecommunications company, insiders are saying that the transaction did little to liberate Italy's telecommunications market, and instead, telecommunications equipment suppliers are about to gain control of the firm.

The company in question is the Società Italiana per L'Esercizio Telefonico S.p.A., also known as Sip. Thirty percent of Sip was sold to investors this year, but reportedly in a manner far different from last year's privatization of British Telecommunications — and with different results.



MILAN, Italy — The recent surge in growth of Italy's computer-aided design and engineering (CAD/CAE) markets is expected to begin diminishing as demand shifts to small firms buying mostly low-end products.

While the Italian CAD/CAE market has grown about 96% each year in the last two years, from \$19.3 million in 1982 to \$73.8 million in 1984, the rate is slowing and should stabilize at 25% or 30% through 1990, according to Reseau Research of Milan.



HONG KONG — Anguished users in Hong Kong are asking Omicron, a British software firm, not to make good on its threat to close its former Asian distributor and cease customer support. The threat arises from a dispute concerning the distributor's unpaid royalties.

At particular risk are Hong Kong users who bought modified versions of Omicron's multiuser accounting package from the software's sole Hong Kong distributor, Advanced Computing Resources Ltd.

Omicron successfully sued the distributor in a Hong Kong court in November for one month's royalties plus expenses. Omicron then drew up a shutdown order against the firm under local law.



SEOUL, South Korea — South Korean electronics giant Lucky-Goldstar plans to increase production capacity at a plant outside Seoul in order to produce the Honeywell, Inc. DPS 6 line of minicomputers.

The DPS 6 is manufactured in the U.S. by Lucky-Goldstar's partner, Honeywell.

Two manufacturing lines at the South Korean plant will be dedicated to Honeywell's DPS 6 line.



SYDNEY, Australia — ICL Australia sent shock waves through the computer industry last week when it laid off 75 employees, about 10% of its work force.

The move was intended to improve profitability, which had been "disastrous" since the boom days of the 1970s, according to the firm's managing director, Chris Wilkinson.

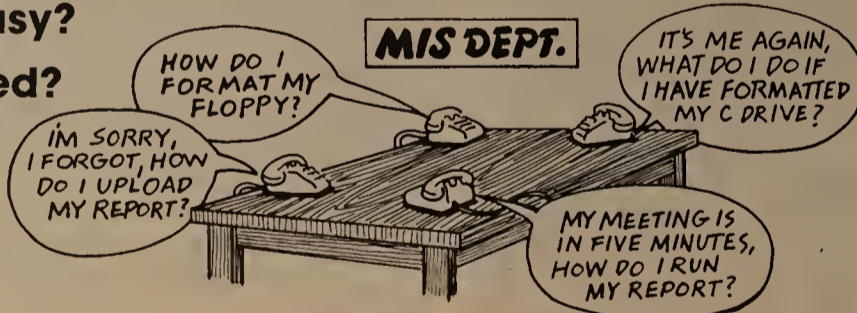
The layoffs will occur primarily in the administrative and corporate support services areas of the organization, including the marketing department, which will lose half of its staff.

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On the Information Center Strategy

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However, one of the major problems many companies face is the variety of software and databases located on different mainframes, departmental minis and personal computers. The challenge is to create an environment that integrates this diversity, is

"Open system architecture is key in implementing an information center strategy."

responsive to the corporate user community in meeting its information needs and, most importantly, provides access that is consistent and transparent. This is why open system architecture is key in implementing an information center strategy.

It also makes particular sense for a software company like Cullinet to adopt a policy of open system architecture that allows corporations to standardize on Cullinet's products without losing a significant investment in other vendors' products—whether they are mainframe applications, microcomputer software such as Lotus 1-2-3, Symphony and other PC products or departmental minis from companies like Digital, Data



General, Wang, Hewlett-Packard and others.

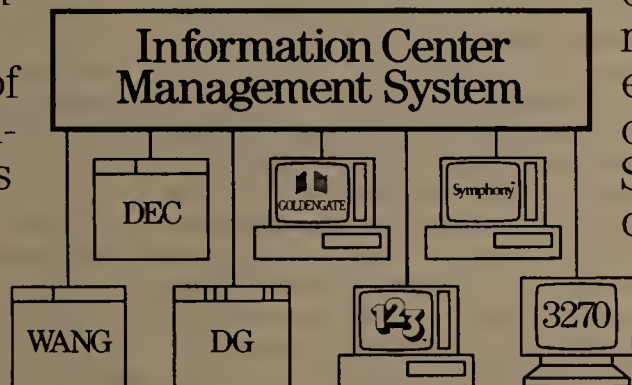
That's why Cullinet has introduced the Information Center Management System. It's one part of a strategy that makes it much easier for the VP of Information Systems to standardize on the full range of Cullinet software, including our proven mainframe database and applications and our integrated GOLDENGATE microcomputer software.

Our strategy makes sense not only because Cullinet products are designed to work together, now and in the future; but also

because our open system architecture means that data processing management will be able to accommodate satisfied users of other software while anticipating the introduction of new products.

For more information about the Information Center Management System and the full range of Cullinet products, I encourage you to phone, toll-free, 1-800-225-9930. In Massachusetts, the number is 617-329-7700.

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Cullinet

NEWS

Microcom opens modem standard

From page 1

by Tymnet, Inc., can be used to minimize errors in data transmission and thus increase data throughput.

MNP was originally made available for licensing in July 1983 and has been locked in a popularity battle with Tymnet's X.PC, which has been in the public domain for more than a year.

Most major modem manufacturers and value-added network operators have thrown their support behind one of the two sides.

MNP supporters

Among the modem manufacturers supporting MNP are Case Communications, Inc., Cermetek Microelectronics, Inc. and Racal-Vadic, Inc. as well as Microcom itself. Concord Data Systems, Inc. allows users to choose either of the two error checking schemes as an optional feature on its modems.

Hayes Microcomputer Products, Inc., Racal-Vadic and Prentice Corp. have all announced support of X.PC in the past six months, but none of the three has made the protocol available in its products.

Tymnet X.PC specialist Steve Y. R. Kim claimed the trio of modem manufacturers, along with MCI Communications Corp. and software producers Microstuff, Inc. and Microsoft Corp., are in the process of implementing

X.PC into their products.

Microcom will no longer charge a \$2,500 license fee for Classes 1, 2 and 3 of its MNP, which will now be available to interested parties for a \$100 documentation fee. Classes 4, 5 and 6 of MNP will remain proprietary. Class 4 is a refined version of MNP Class 3. Class 5 offers the capabilities of Class 4 plus a data compression feature. Class 6 supports data transmission at speeds up to 19.2K bit/sec. while maintaining modem compatibility with most popular dial modems.

Announcement scheduled

The vendor is scheduled to announce the move at a meeting of the U.S. CCITT Study Group D Modem Working Party's Sub-Working Party on Error-Checking Protocols in Marina Del Ray, Calif., tomorrow, according to company spokesman Doug Landfield.

The announcement is designed to increase usage of the protocol, a move that Microcom hopes will enhance MNP's chances of becoming an international standard.

Robert Fenichel, chairman of the U.S. CCITT Study Group D Working Party, said the sub-working party will be meeting for the first time and the gathering may attract as many as 25 attendees.

He said all the sub-working party findings will be presented to the parent group Wednesday for possible submission to the CCITT.

Wallace is a staff writer with On Communications, a CW Communications, Inc. publication.

Vendor's MIS can't wait for other users to work out bugs

By John Gallant

WESTWOOD, Mass. — Playing it safe is a luxury Bruce Pocock cannot afford.

Some DP managers can postpone installation of the latest hardware or hold off implementing the most recent version of a software package rather than chance upon an unforeseen bug or a hidden incompatibility. They wait until the enhanced system meets the tests of time and wider use.

But as director of data center services for Cullinet Software, Inc., Pocock is the top technical guru in an organization teeming with techies. He knows that keeping the leading independent data base management system vendor's management and software developers in tune with the latest high-tech developments is perhaps his most important role.

"Because our product is software, we have to keep up with what's new in hardware and software," Pocock said. "So I manage the data center with an eye to the state of the art."

Tall and slender, the bearded Pocock characterizes himself as a market watcher as well as Cullinet's central service provider. "I keep very close tabs on the market and disseminate that information to both our developers and our managers. I have to facilitate that upward and lateral information flow, so I try to have a wide sense of what is going on. Other sites can stay several releases behind, but our environment is very dynamic. That puts a lot of pressure on me because not all new products work. That's my biggest source of aggravation."

Pocock is responsible for supporting as many classes of users as there are data centers within Cullinet. His more than 40-member staff, which is divided into five functional groups, oversees four data centers. One is the Cullinet-BWCS Software, Inc. development center in Oak Brook, Ill. The Cullinet-BWCS Software subsidiary is the former Bob White Computing & Software, Inc., which Cullinet acquired for its banking applications. Another is Cullinet's National Education Center in Framingham, Mass., which supports both on-site and remote user training.

In Westwood, where Cullinet has four buildings linked by twisted-pair wire that the company purchased from a telephone company and installed itself, Pocock directs operations in the software vendor's two primary data centers. Cullinet's commercial data center supports the company's time-sharing customers. The corporate data center is the backbone of Cullinet's own production systems and all its product development, support and testing.

The four data centers house six IBM and National Advanced Systems Corp. mainframes, from an IBM 4341 Model Group 2 under MVS/SP to an IBM 3084 Model Q under MVS/XA and almost 100 IBM 3380 and 3350 disk drives containing more than 140G bytes of data. More than 1,500

terminals located at Cullinet facilities throughout the world are tied into the corporate data center through two 56K bit/sec. and four 9.6K bit/sec. communications lines. Anywhere from 20 to 25 on-line systems are running at any one time, Pocock said.

The data centers support the activities of four primary groups of users, including Cullinet's approximately 180-member applications product development and 80-member systems product development groups, the roughly 150-member technical support group and in-house end users of production applications.

Development and implementation of those production systems is the responsibility of Cullinet's MIS department. The end-user-oriented MIS department evolved separately from

Pocock's data center organization, which is responsible for managing the firm's data communications net, hardware and software.

In addition to his main duties, Pocock recently had to oversee the transfer of the bulk of Cullinet's computer and com-

munications equipment to a new data center. The move coincided with what he labeled a total systems re-configuration, including the upgrade of one of the company's IBM 3081 mainframes to a 3084 and a 40% increase in the DASD capacity. In his understated manner, Pocock said the move went off without a hitch.

Contrary to the experience of other DP professionals, Pocock said he finds supporting end users a relatively easy task. "The end-user environment is carefully planned here. There are scheduled system implementations and scheduled upgrades," he said.

"But within the development environment, things change much more quickly. That's the challenge of supporting software developers," Pocock said. "The data center is often the development staff's last concern. Their needs grow very quickly. Also, development work causes a lot of totally unplanned for occurrences."

But the plethora of technical personnel within Cullinet is also something of a blessing. "Developers know what you can and cannot do," Pocock said. "Sometimes it's hard explaining satisfactorily to end users why their needs can't be met right away. But developers understand DP, and they can be very creative in offering solutions or alternatives."

Pocock said he has yet to call upon the technical staff for assistance. "So far, it hasn't been necessary to rely on them," he said, "but it's nice knowing they're there."

Despite the administrative demands of his position, Pocock maintains a hands-on approach to his work. "I am a very technical person. I am capable of doing almost anything, and I like to stay technically involved," Pocock said. "That's a self-imposed pressure. But I like to see problems handled quickly and with a smile."

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To attend the next free, half-day seminar in your area or receive additional information, write Oracle Corp., Dept. C4, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 1-800-345-DBMS. From now on, it's the only DBMS phone number you'll ever need. Following is the ORACLE seminar schedule:

ORACLE Seminar Schedule

Albuquerque	Nov 26	Los Angeles	Oct 22, Nov 19	St. Louis	Nov 14
Austin	Oct 3	Minneapolis	Oct 10	Salt Lake City	Nov 14
Boston	Oct 15, Nov 12, Dec 11	New Orleans	Nov 19	San Antonio	Oct 23
Chicago	Oct 16, Dec 12	New York City	Oct 10, 25, Nov 6, Dec 12	San Diego	Nov 7
Cleveland	Nov 5	Newport Beach	Oct 17	San Francisco	Nov 5
Columbus	Oct 8	Oklahoma City	Nov 7	San Jose	Oct 24
Dallas	Oct 8, Nov 13	Omaha	Oct 24	Seattle	Oct 2, Nov 26
Dayton	Oct 9	Orlando	Oct 15	Syracuse	Nov 7
Denver	Oct 29, Nov 20	Phoenix	Oct 9	Tulsa	Oct 29
Detroit	Oct 22, Nov 12	Portland	Oct 10	Washington	Oct 10, 24, Nov 7, Dec 10
Houston	Oct 31, Nov 21	Rochester	Oct 10, Dec 5	Wichita	Oct 3
Kansas City	Nov 6	Sacramento	Oct 8		

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NEWS

Denny's tests disaster team

From page 1

earnest, Kislowski said.

Like Denny's, practically every other large user organization boasts a disaster recovery plan in one form or another. But fewer than 5% of the users conduct periodic drills under realistic conditions to find out whether their plans are as sound in practice as they seem on paper, Kislowski claimed.

Moreover, of the 5% of the data centers that do test their plans, only a tiny fraction control extensive point-of-sale (POS) networks from one central location. Denny's operates a dial-up polling network that serves not only the firm's 1,200 family restaurants but also its wholly owned chain of 800 Winchell's doughnut shops.

Denny's also operates a second network that supports routine administrative applications like payroll and a third network that automates the order entry process for the company's more than 1,800 outlets.

"That distribution network is probably our most critical application," Ride said. "Without it, we would be unable to order food or other goods, and our whole business would grind to a halt in just a day or two."

All three of the networks rely exclusively for their support on the lone Denny's data center south of Los Angeles. So if the installation,

which houses an IBM 3033 and an Amdahl Corp. 5850, suddenly succumbed to a disaster, the company would instantly lose the operational hub for all its key functions.

"We operate under a very different kind of environment from what is typical of many other large POS networks, most of which depend on multiple data centers that can provide each other with backup," Kislowski said.

Mindful of the pitfalls inherent in

”

At approximately 3 a.m. PST on Nov. 19, Evan Ride, Denny's director of computing, called the data center, alerted an operator to the fictitious disaster and instructed him to initiate a drill.

maintaining just one corporate computing site, Denny's timed the latest of its disaster recovery drills to coincide with Ride's recent trip to Dallas for an IBM Guide users group meeting. At approximately 3 a.m. PST on Nov. 19, Ride called the Southern California data center from his Dallas hotel room, alerted an operator to

the fictitious disaster and instructed him to initiate a drill.

The operator then rushed to a neighboring Denny's building and called all eight members of the company's disaster recovery team at their homes. By 7 a.m., six of the eight team members were winging their way in two groups toward Dallas, with the remaining two scheduled to follow later in the day.

Accompanying one group on its five-hour flight was a set of operating system tapes that had been retrieved earlier in the morning from Arcus Off-Site Storage Corp. in the Southern California community of Norwalk. The tapes were required to get the operating system in the backup center up and running in preparation for the arrival of Denny's application data, which was shipped from Arcus early in the afternoon.

By 9 p.m., the emergency setup team had restored the firm's operating system and TSO functions on an IBM 4341 belonging to Comdisco Disaster Recovery Services, Inc., which maintains the Dallas backup data center. An hour and a half later, the systems restoration process was complete as the makeshift facility began demonstrating its ability to run Denny's key batch applications.

Although the drill was by and large a success, it did uncover 26 areas where the company's disaster recovery plan needs improvement. In particular, the exercise dramatically underscored the importance of anticipating every possible financial contingency. The failure of one drill participant to carry credit cards and sufficient cash temporarily stymied payments to Arcus and delayed tape deliveries for two to three hours, according to Denny's data center manager, Shep James.

Next spring, the restaurant chain said it expects its data center recovery drill to be repeated, although the scope of the upcoming mock catastrophe will probably be greatly magnified. "In our future tests, we're planning for a disaster like a major earthquake in which all of Southern California, including Los Angeles International Airport, disappears as a functioning business unit," Kislowski said. "We want to condition people to think on their feet and see if they have enough brains to fly to Dallas from an alternative airport in San Diego, Las Vegas or Phoenix."

FCC rules on separation of services

By Bryan Wilkins

WASHINGTON, D.C. — The Federal Communications Commission further eased its Second Computer Inquiry separation rules recently by waiving requirements that AT&T must provide enhanced services such as airline voice reservation systems through a separate subsidiary.

The FCC, which is reviewing the Computer Decision II regulations, took a similar step in October regarding the separation conditions attached to selling customer equipment, voting to permit AT&T to mingle equipment sales with its basic long-distance network services, subject to certain conditions.

AT&T said its enhanced services were irrelevant without the similar treatment accorded to the equipment component of the same service, and the requirements prevented it from meeting customers' needs in "the give and take" of the customer premises equipment marketing process.

The FCC attached the following conditions to the waiver:

- The enhanced services must use computer facilities that are not co-located with AT&T network facilities.

- The interface of the enhanced services must be available to other enhanced service providers.

- The services must be offered through an entity other than the regulated AT&T Communications.

- The enhanced service must use regulated, tariffed lines.

The waiver request was opposed by GTE Corp., most of the regional Bell holding companies and the major computer and value-added communications service providers.

The FCC said that granting the waiver did not prejudice its decision on the pending Third Computer Inquiry proceeding that would make concrete the type of relief to be granted to AT&T by deregulating enhanced services and by eliminating the separate subsidiary requirement where competition was present.

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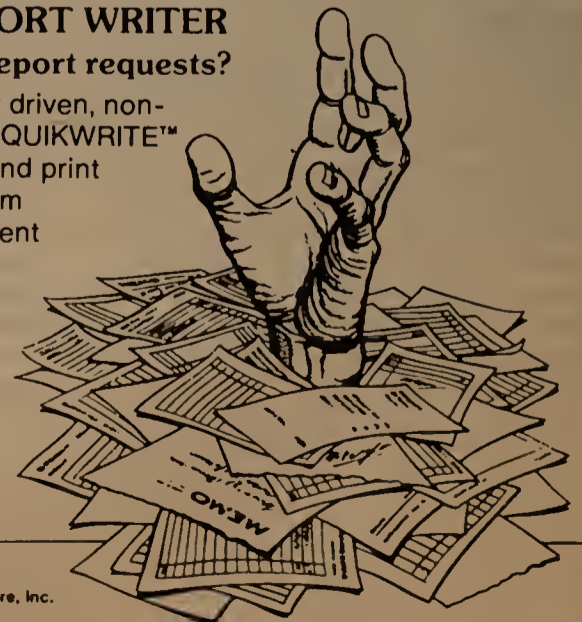
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NEWS

Wall Street snubs DBMS

From page 1

"It's hard to find a data base management system that isn't more up to date than VSAM and IMS," said Gerald C. Chichester, chairman of Focus Research Systems, a West Hartford, Conn., software market research firm.

At the same time, both outside observers and MIS directors for the brokerage houses said their high transaction volume, frequent updating and need for swift, reliable access to data have kept them from embracing modern systems. Although they acknowledged that they would benefit from easier user access and more variable data output, they have shied away from any form of relational data base management, including the relational capabilities of IDMS, to avoid increasing their processing overhead.

"In a manufacturing industry, the data base represents record keeping. In the brokerage industry, those data bases represent the product itself," Chichester said.

"One is less willing to accept risk when the information stored on the computer and the product are one and the same," he added.

'More backward than it should be'

Another observer stated the case more bluntly. "It just mirrors the data processing world of Wall Street. It's a little more backward than it should be," according to Michael Braude, vice-president of software services at the Gartner Group, Inc.

With the exception of Morgan Stanley & Co., most of the brokerage houses are dependent on 10- or 15-year-old systems, and that dependency is increasing as applications are added to those systems.

"A brokerage house is not like the insurance industry where you have a file and nothing happens to it until the next transaction," said Jeffrey Gevarter, first vice-president for information systems at Prudential-Bache Securities, Inc.

A brokerage house has to update all of its accounts after each day's trading. The value of a customer's portfolio will change even on days when he makes no trades because of interest rate changes and the movement of the market, and the brokerage house has to be ready to tell the customer what the investments are worth. Yet the amount of available update time keeps shrinking, Gevarter said.

Prudential-Bache does business on the Pacific and the over-the-counter stock exchanges, and by the time they report their trades, it may be 8 p.m.

The New York Stock Exchange, which used to open at 10 a.m., now opens at 9:30 a.m., and Gevarter must have all accounts updated by 8 a.m.

Cannot afford luxury of DBMS

"It's a very, very tight window, and it's getting worse. In terms of processing time, we just cannot afford the luxury of a data base management system," he said.

Prudential-Bache began building its operations around Cullinet's IDMS data base management system several years ago, but it has since veered

from too much dependence on it.

When it adds applications, Prudential-Bache tends to rely on IBM's VSAM file management system. "Less than 50% of our applications are on IDMS," Gevarter noted.

And for one application in particular, he said, "If I had it to do over, I never would have made it a data base system."

VSAM first became available in 1973. One MIS director of a brokerage house derided the "modern, benighted thinking" that considers VSAM an outmoded tool, while another said he was "comfortable in thinking of it as a data base management system, a brute force data processor."

Other authorities say they disagree.

James Martin in his book, *Managing the Data-base Environment*, called VSAM a non-data-base environment in

which each application functions with its own file system. Once the file system is set up, the data is stored and retrieved the same way each time, making it difficult to change the application.

"Using VSAM is superconservative," said Ed W. Acley, senior consultant with the International Data Corp. in Framingham, Mass., a market research firm. "IMS is the next most conservative approach."

In addition to Prudential-Bache, a number of brokerage houses use a combination of VSAM and Cullinet's IDMS and said they are unlikely to drop their dependence on VSAM.

"We're quite happy in a mixed IDMS and VSAM environment," said Robert Chamberlain, vice-president of data resources administration at the Shearson Lehman Brothers, Inc. division of American Express, Inc. Shearson Lehman used VSAM for batch processing before acquiring

IDMS and continues to rely on it for some new systems. Chamberlain said VSAM is valuable for its speed and "data delivery power."

In a similar manner, Dean Witter Reynolds, Inc., a Sears, Roebuck & Co. subsidiary, relies on VSAM to do its mainstream processing with selective applications tied to IDMS. Dean Witter has experimented with Cullinet's relational aspects of the Cullinet product but has no plans to put them into production, said George R. Ross, executive vice-president in charge of data processing.

At most brokerage houses, the need for speed and reliability not only yokes the back office to the established file or data base systems, it forestalls conversion to new ones.

Prudential-Bache's Gevarter acknowledged that using VSAM leads to duplicate files because applications us-

ing the same data have no means of sharing the way applications built around a common DBMS could.

"We replicate our data in three or four places," but that leads to quick processing speed, he said. IDMS has "too much overhead" for swift processing, he said.

The prospect of converting to a full DBMS is something MIS directors at the brokerage house don't like to talk about.

Work involved is 'mind boggling'

"There are so many man-years of work involved it's mind boggling," said a Paine Webber, Inc. vice-president, Ted Hochman, whose firm uses Computer Corporation of America's Model 204 for most production applications and has implemented IDMS for selected tasks.

One firm that has made the decision to go to a centralized DBMS is Merrill Lynch. James Murtha, vice-

president of the Information Architecture group, said his staff had years of experience with IMS before it was decided to reorganize around it.

At an institution that processes two million transactions a day, "there was some reluctance to go into DBMS. We had heard of companies that got burned with the overhead," Murtha said.

Merrill Lynch has 18 projects under way to write applications to run off a handful of central data bases. The largest, Merrill Lynch's six-week record of transactions, occupies 22 3380 disk drives and had to be divided into 24 subsets for rapid retrieval and updating.

The brokerage house currently handles 20% of operations through its DBMS. By the end of 1986, 80% of operations will be converted to DBMS, Murtha said.

At Morgan Stanley, data base administrator Scott Abbey said that his firm has taken the process a step further.

Using Software AG's Adabas and the Natural fourth-generation language, Morgan Stanley's MIS staff is able to access the central data bases from any of its 50 applications, allowing more integrated functions.

Four times as fast

Abbey said the 120-person programming staff can build applications four times as fast as those using Cobol, which leads to savings that can be invested in more hardware to maintain processing efficiency.

Conversion was not a problem because Morgan Stanley had few existing systems when it decided to use Adabas eight years ago, he said.

But the payoff comes in linking applications. When brokers make trades, they can enter them into the house accounting system, have them added to their account position "and have that immediately priced to the market in real time," Abbey said.

That form of updating and retrieval will enable Morgan Stanley to keep its customers more up to date as well, he said.

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'It's hard to find a data base management system that isn't more up to date than VSAM and IMS.'

— Gerald C. Chichester
Focus Research Systems

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NEWS

IBM Information Services' Berland refutes critics charges

Strategic planning executive speaks out on pricing, size, quality, direction

By John Gallant

A senior IBM executive last week challenged critics' claims that IBM's applications software portfolio is too large and diverse and often does not match the quality and functionality of independent vendor offerings. In an interview with *Computerworld*, Robert Berland, who became director of strategic planning for IBM Information Services in January, also defended the pricing policies that in October led to the announcement of an average 10% increase on more than 1,100 applications and utility software packages.

Berland is the field marshal who directs IBM's efforts on the applications software battlefield. Information Services encompasses Information Programming Services (IPS), which develops, acquires and supports applications for the entire range of IBM hardware; the IBM Information Network remote computing services unit; and Information Systems Services, which offers program customization and consulting services. Berland is responsible for

coordinating the efforts of the three units and for developing and implementing IBM's worldwide applications software strategy.

IPS is responsible for roughly 2,000 program products. Critics say that is simply too large a portfolio for any organization to support or market adequately. Is there any validity to that criticism?

Yes, that's absolutely correct. Two thousand products is too difficult for the customers and field force to understand. What you want to drive toward is families of products that fit and work together. Examples of that are MAPICS, COPICS or the Personal Decision Series. We are moving in that direction as best and as fast as we can.



Berland, IBM's field marshal

Your organization is responsible for applications products, while the hardware divisions retain control over systems software. Considering the increasing revenue importance of software, is IBM shifting its organizational structure to place all software under the control of one group, notably yours?

Today, systems software, the access methods, the data base and data communications software are under the individual product divisions. I don't see any change in that. Those products are very tightly coupled to

the hardware; they have to exploit the hardware. Applications software can ride on well-defined interfaces that don't have to be quite as close to the hardware. That software can be developed by an organization like ours or by outside software vendors or customers themselves.

Periodically, IBM increases software prices as a result of what it calls "normal business review." Can you explain that phrase and give us some insights into IBM's software pricing strategy?

Software development is an incredibly expensive area. Marketing, support and distribution are also expensive, people-intensive functions. Since the cost of people tends to go up every year, the cost of all the ancillary elements of the software business tends to go up every year. Also, exploiting the characteristics of the hardware requires a huge investment in software enhancement, which many software companies don't bother to do.

The only counterbalance to that cost is to get huge volumes. Huge volumes require great marketing effort. That equation hasn't totally come together yet. It is still a very tough, challenging business. You can see examples in other companies and within IBM of individual products that are successful. But it's hard to find companies that have two, 10 or 50 successes. Prices go up because we not only have to put out one product but we also have to put out families of products that work together and can grow over time.

After the last round of increases on applications products, many users said the price hikes were unwarranted because they had not been accompanied by any enhancement of the affected packages. Is that a valid criticism?

The packages are continually under enhancement, continually under upgrade. The key ones — the program products, the major strategic products — have ongoing development, support, marketing and education requirements. If more customers would buy those products, it would help us all relative to pricing.

Is IBM talking to its customers about site licensing of micro software?

Site licensing, where you grant a license for unlimited copying, is wrong because you have no asset protection. You have no way of keeping track of who has the software and how it gets distributed. One of the major problems in the industry — one that leads to price problems — is illegal copying. If you mean volume discounts, I am a fan of that. Volume discounting done right is of great benefit to the customer and to the vendor. But volume discounting implies a fixed number of licenses such that you can maintain some kind of asset protection. IBM does volume discounting now.

One of the most persistent prognostications is that IBM will strengthen its position in the applications market by acquiring one of the applications vendors. Is that really an option?

I hope we will strengthen our position in the applications market. I don't hope we will acquire a company. One of the prime responsibilities of IPS is the acquisition of applications software. There is no way IBM can write all that software. There are whole applications that we can't spell. For example, we have great lawyers in IBM but we don't pay them to come up with the specifications for a law office package. When we needed a package for System/36, we went outside to get it.

We have to do that in a large number of applications areas. You don't hire people right out of college, stick them in a blue suit, grow them in your own image and expect them to be industry experts in banking or insurance. As I've said, more than 50%

of our revenue in the applications area has to come from stuff we get outside.

IBM is faulted for not offering applications of the same quality or functionality as those offered by independent vendors. Do you think that criticism is unfair?

Yes, it is very unfair. I'll match

MAPICS with any product in the world. I'll match Business Management Series on the Personal Computer. It depends on the product. You cannot expect us to write the best package in the world in an area where we don't have expertise. I think many of our products are superior products, like ISPF, the dialog manager. That is an outstanding product used by many software companies.

We wouldn't write a spreadsheet product just to offer another spreadsheet. For us to write a stand-alone product is almost ridiculous. Outside people are writing them, and that is fine.

We focus on the areas we have strengths in and where there is the greatest need. That is the interconnection of intelligent workstations, departmental machines and hosts.

It's said that IBM is hampered in software innovation by its limited programming resources, the sheer size of its user base and by the perceived attempt to be all things to all people. How much of that is accurate?

There is no question there are not enough programmers to do everything we would like. We have multiple projects all fighting for dollars and skills and head count. We have to prioritize. You prioritize based on opportunity but just as much based on skill.

We are not building products for a few customers. We build for thousands of customers. That requires a commitment, a skill level and a support level far beyond what most people can do in a garage.

See BERLAND page 15

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NEWS

Berland on IBM, critics

From page 14

Thank God for the size of the user base. I wish it was much larger. The bigger the base of customers, the better it is for your business, your opportunities, your leverage.

On the other hand, you have a commitment to customers to take them forward and to grow with them. Yes, there is a big base that you have to consider. But we also do some revolutionary things such as DB2 and SQL. We provide them to the customer in an evolutionary manner so that they can take advantage of those capabilities at their pace.

You have defended IBM's dual data base management system strategy [CW, Nov. 25]. One could assume you believe relational systems cannot be improved to handle high-performance applications. Are users likely to require differ-

ent DBMS for different needs for the foreseeable future?

I didn't say that. Quite the contrary. I said relational systems can be improved over time. What I implied was that I don't believe that for a long time there will be any chance a relational system can compete with an IMS Fast-Path handling 160 transactions per second.

There is a place for continually improving relational into much higher performance. I don't see there is a limit to that. But you have to realize the pressure from large customers on IBM for IMS. We have to continually improve IMS Fast-Path and IMS.

I guess the best answer is to talk to some of our customers. People are using our DBMS and others. But when it comes down to the highest performance, highest integrity, highest exploitation of the hardware, it is hard to come close to IMS and IMS Fast Path.

From your remarks, it seemed clear that IBM has focused on

boosting performance. If productivity has become the primary concern for all but the most transaction-intensive shops, is IBM ignoring the bulk of users by not providing productivity tools?

We are trying to support the largest customers in the world. For example, we have

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I think the stand-alone Personal Computer will always have a place, but it is very secondary to the future of it as an intelligent workstation.

a customer with more than 30,000 terminals interconnected on IMS systems worldwide. The performance requirements of systems like that are such that the hardware and software communities in IBM have to work closely together to provide what customers need.

One of the dictates of IBM management is that software should never be the bottleneck that holds our customers back from running their business. That requires tremendously skilled people and products that can continually change and evolve.

AT&T to sell firm's data base packages

MENLO PARK, Calif. — Relational Database Systems, Inc. announced that it has signed an agreement with AT&T whereby AT&T will co-label and market four of Relational Database's data base packages for the AT&T PC 7300.

The four data base products include the following: Informix, Relational Database's flagship relational data base management system that runs in SQL; Informix Runtime, a version of Informix designed for value-added resellers; C-ISAM, the standard file access method for the AT&T Unix operating system containing a library of C language functions; and File-It, an interactive file management system.

Relational Database also said that it had reached an agreement to co-label and distribute for AT&T data base software for AT&T's PC 6300 and the entire 3B family of microcomputers and minicomputers.

— Bryan Wilkins

Productivity is fundamental to our customers. All of them need tools. We would like to provide them with answers as quickly as possible. But we cannot do everything as fast as the customers or I would like.

We are dumping tremendous effort into the PC, which I believe — coupled properly as the intelligent front end — can give the most productivity boosts to our customers. Just productivity boosts in the hosts are not enough. God bless the industry for coming out with innovative approaches. We're trying our best too. It is great that everybody is focused on that problem because it is one that needs to be addressed by all of us.

Do you think the picture painted by analysts and the press is an accurate reflection of IBM as a software company?

No. There is a tendency to equate IBM with bigness and bigness with badness. The beauty of IBM is the people and the management.

Recognizing the importance of software, we are given opportunity, freedom and areas to pursue in which great achievements can be made. I think there is this view of the monolith that moves so slowly. That is not true. An example is the Personal Computer. That wasn't even an industry. Between Apple Computer and us, a whole industry evolved. We were pretty light on our feet in that area. I think we have been pretty light on our feet in some of the software arenas.

Recently, we've seen a number of artificial intelligence product announcements from IBM. Has AI become a strategic research and development focus within IBM?

Certainly. IBM has focused on AI as an important

additional capability that will be required in the future in many different areas. AI is not an end in itself; it is a vehicle. I see AI as an interface, a usability characteristic — a way to work with, for instance, data bases in the future.

What is IBM's AI strategy?

There are needs across a broad front of products on intelligent workstations, departmental systems and hosts. People want easier-to-use, better front ends. What you will see is the proliferation of AI approaches — what we call knowledge-based systems, as aids to help end users access information.

What new technologies do you see impacting the software market?

The No. 1 concern is intelligent workstations attached to departmental machines attached to host systems. The interrelationship between software will require some very sophisticated inner attachment capabilities.

But, even more important, it will require some significant progress in the synergism between applications in that cross-tiered environment. It will require improved end-user interfaces to mask all the stuff that sits behind an intelligent workstation.

I'll call the workstation the Personal Computer for short. I think the stand-alone Personal Computer will always have a place, but it is very secondary to the future of it as an intelligent workstation. The Personal Computer is going to be the fundamental end-user interface. We have to take advantage of the power, graphics capabilities and user friendliness that it can provide as a front end to, say, departmental or host applications.

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VIEWPOINT

EDITORIAL

Japan Inc.?

For most American DP/MIS professionals, the phrase Japan Inc. is little more than some inventive headline writer's shorthand reference to the Japanese people's postwar industrial boom and continuing high-tech development. If anything, the phrase has more relevance to their private lives, as consumers of Toyotas and Sonys, than their professional lives.

Upon closer examination, however, Japan Inc. is something more than a catchphrase but considerably less than a concerted national industrial policy geared toward world trade domination.

In fact, Japan's computer manufacturers are as independent and fiercely competitive as their counterparts in the U.S. They cooperate with government policy when it serves their needs and kick and scream when it does not.

American DP/MIS professionals have been exposed to elements of this reality over the past few years as Japanese manufacturers have made a concerted effort to penetrate the U.S. computer market by forming partnerships with U.S. companies. This has not been some ominous, monolithic Japan Inc. infiltrating corporate America. This has been NEC Corp. becoming NEC/Honeywell and Fujitsu Ltd. becoming Fujitsu/Amdahl.

These partnerships, whatever their commercial success, provide U.S. vendors that are suddenly strapped for development funds with access to Japan's leading-edge technologies and offer Japanese manufacturers entry to U.S. DP/MIS departments. The ultimate benefit will be improved products, competitive prices and innovative technologies.

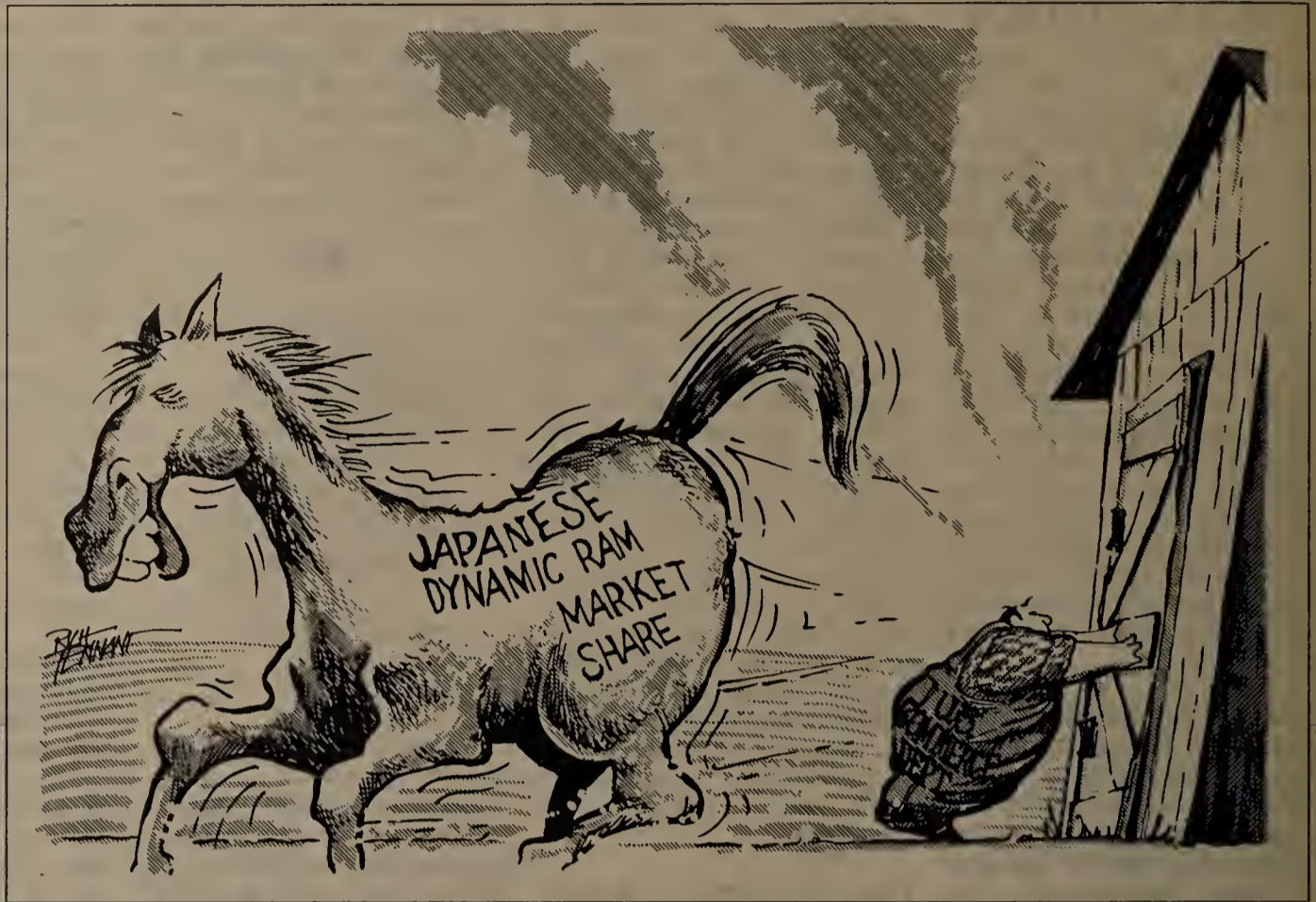
The one barrier to this progress is trade restriction born of xenophobia and misunderstanding. Yes, Japan itself needs to open its domestic markets to foreign products. But Americans must also realize that a great many U.S. companies have set up shop in Japan, buying or producing goods there and re-exporting them back home. The U.S. trade deficit is a serious problem, but it should not be invoked to oppose technical progress.

Partnerships between manufacturers must be encouraged, and technology exchanges must be nurtured. Ties must be established between American DP/MIS managers and Japan's growing pool of talented young computer professionals who have proven their skill at managerial as well as technical innovation.

For the information age to be truly international, trade disagreements must give way to open cooperation. Then, the computer community around the world can profit and prosper.

Notes & observations

Not everyone in the market is getting rich, but at least the superminicomputer industry isn't dull. In September, Perkin-Elmer Corp. introduced its high-end supermini, the 3280MPS, with comparisons with the Digital Equipment Corp. VAX 8600. Then Data General Corp., whose Eclipse MV/10000 may have lost some technological and price/performance edge to the 8600, fought back in November with its own high-end supermini, the MV/20000. Now, it's December, and here comes DEC with an improved version of the 8600. The 8650 could be the new standard for superminis ... or it could signal, as DEC claims, its entry into the mainframe arena. As we said, it's never dull.



LETTERS TO THE EDITOR

Expert systems software capable of 'reasoning' but not 'learning'

I take strong objection to your In Depth title, "Software that learns" [CW, Nov. 11]. AI software does some marvelous things. Expert systems software can do reasoning, computer configuration and problem diagnosis in phone lines or oil wells or sick human beings or soup cookers or chip etchers.

People study and learn *with* programs and machines, which is hard enough. Expert systems do not dynamically add rules or change their procedures or in any way adapt or learn.

I believe that it is possible to be both exciting and accurate. You can say, "Machines that reason," by reason meaning "infer" and draw conclusions.

But "learn" is not a description of the present programs nor of any programs about to appear.

Don Lerner

United Telecommunications, Inc.
Westwood, Kan.

Education will head off layoffs in previously protected DP ranks

The editorial "Don't cut here" [CW, Nov. 18] struck a nerve. The previously privileged status of DP employees is the primary reason that actions reducing their personnel and budgets are more than appropriate. Historically, DP management has been rewarded based more on direct responsibility — translation: how much they could spend on hardware, software, maintenance and personnel — than on results achieved.

It is very easy to consume people and funds when the typical DP management professional allows the whims of a single computer manufacturer to determine the company's direction and staff requirements. These are the same professionals that would commit to special wiring for buildings based on future promises by a computer manufacturer to use them someday in a grandiose scheme.

Reductions in budgets and personnel would probably force the old school to look for more efficient ways to survive, as other departments such as sales or manufacturing have done. These methods should include first-rate relational data base management system with fourth-generation languages and generic operating systems that put

manufacturers into a true cost-performance environment and protect software investments and distributed or departmental processing.

My definition of distributed processing does not include systems fully dependent on the same incumbent empires for hand-holding, permission and so on. It would mean serving departments or clusters of users through cost-efficient and fully self-supporting multiuser and multitasking superminis and superminis.

This approach keeps the detailed data closer to users and allows summarized data that is of interest to corporate executives to be uploaded. Future planning for larger corporations should include at least a cursory look at knowledge engineering and similar advances for computers besides just processing data.

Education should begin with DP staff members to find alternate ways to provide solutions other than through the hiring of bodies. This new knowledge could then be directed to the user community so that they might serve more of their own needs.

I would suggest, before expensive searches are undertaken for outside help, that a serious study of recent computer science graduates already in-house might reveal some excellent sources if they were asked what they could contribute to the organization.

Education should be the primary purpose of DP professionals. Those that attempt to keep a hold on the status quo are on borrowed time.

Randall K. Cullinan
Communications +, Inc.
Richmond, Va.

Data transmission by way of CATV could pose computer security threat

It's interesting that *Computerworld's* Nov. 25 issue features a Special Report on computer security, "System security — Protecting corporate information assets" along with an article on using CATV for data transmission, "Legal hang-up: State blocks school CATV bypass."

With this use of CATV, what's to keep any home cable subscriber from tuning in to the data transmission channel on the television and browsing through everything that goes over the cable?

Jim Haynes
Associate Development Engineer
Santa Cruz, Calif.

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VIEWPOINT

The myth of the East

By Charles P. Lecht

During the first half of the 1980s, Americans have painted a portrait of the Japanese computer industry that depicts a group of overzealous economic charlatans bent upon usurping U.S. world technological leadership by any means — moral or not.

Competing Japanese scientists, we are told, copy the results of our researchers unfairly and reproduce the products we intend to produce even before we start to do so. Adding insult to injury, we are told that those doing this graduated from U.S. universities where they gained the education needed to carry out their supremacy plans, which they could not have done had we barred their attendance.

According to the originators of this nonsense, who are faced with the need to explain why so many Americans prefer Japanese products over their own, Japanese companies producing these goods have an inclination to dump them at any time and at any cost into our marketplace for one nefarious business purpose or another. Aiding them is the Japanese government which, we are told, subsidizes the companies' losses.

First to paint this portrait of the Japanese computer community is the raft of U.S. companies that enter our own computer industry and are unable to cope with the competition they find when they arrive. Howling "foul" and launching suit to justify

their foul howling, they blame Japanese competition for their financial woes.

For example, despite overwhelming evidence that a semiconductor company cannot expect to survive without a built-in marketplace for its product, such as a computer systems manufacturer or a defense contract, companies continue to enter the field to seek their fortunes without the faintest notion from where it's going to come.

Having spent their load without a score, their directions are now turned to litigation and the Japanese computer industry. Why not? It provides a ready-made defense from investors if bankruptcy is going to occur.

Next in line to buy the Japan-as-scapegoat portrait is the group of politicians representing districts unfortunate enough to have a faltering computer industry. Why blame anything local for the problem? It couldn't possibly be a homegrown snafu; it must be Japanese competition.

In the past five years, we've assigned to Japan just about all the reasons we could think of for our economic woes. Think about it. Whether these were electronics, steel, cars, radios, watches, textiles, toys, television sets — just about everything but oil and software — we have been inundated with unpleasant chatter about Japanese competition. So much so that were we to hear of the failure of just about any commercial enterprise this very day, we may well ex-

pect to hear that Japanese industry was the cause of it — especially if the stakes were high.

One after the other, politicians arrive in Tokyo, meet the local bigwigs, and then give a news conference on Japanese business and the U.S. Never have I heard one who said, "Before I came here I believed Japanese business was at fault, but now I've changed my mind."

Rather, all say exactly the same thing, "You've got to open your marketplace wider and stop dumping your stuff on our shores or else." "Stuff" is frequently a euphemism for high-quality products at cheap prices.

Even our government sees fit to assign fault for its real or imagined international trade problems on Japan. And even though Japan seems inclined at times to admit fault, one suspects that this is merely

tossing a bone to visiting politicians. Japan's Prime Minister Yasuhiro Nakasone went on television, for example, to ask the Japanese people to buy U.S. goods, and he even provided them with a shopping list that included shaving cream and neckties.

A few years ago, I asked a U.S. government official what the U.S. computer industry would do if the Japanese suddenly declared that they would happily make all the computer systems we needed and give them to us no strings attached. He said, "We wouldn't take them; it would be a trap."

But studying the true state of the Japanese computer industry — how

big it actually is in comparison with our own and how dependent it is upon ours — provides motivation enough for any honest person to put aside this attitude.

The precise reasons for Japan's meteoric rise in computer technology may never really be known, although I have some ideas on the topic. First and foremost is the level of U.S. investment in Japan — still most computers in the mid- to large-range produced in Japan are of U.S. origin, including those made by Japanese companies on U.S. licenses. Much of our semiconductor industry is located there.

But of increasing importance is the stability of manufacturing that Japanese companies offer. Only in the U.S. is that stability rivaled. Let's face it; when it comes to the mass production of high-quality electronics, skill alone won't do.

The up-front costs can be so high that the hope of ever seeing a return on investment may only be realized in a country that has a stable government and a peaceful labor force. Think of having made a plant investment in Lebanon in 1980.

"One thing the American computer community never considers is that we wish the peace that prevails in their use of our production facilities were matched by their peace of mind in buying our products too," one Japanese executive said to me. "On the one hand, we cannot turn down the business because we're strapped for cash.

"On the other, we'll never be able to develop our own product ideas if our plant production is substantially consumed making yours." His words portray the true state of affairs as seen by many Japanese computer executives, and we in the U.S. would do well to heed the message they bring.

LECHT ON SCIENCE

”

It couldn't possibly be a home-grown snafu; it must be Japanese competition.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies. He divides his time between Tokyo and New York.

Spies in the workplace

By Thomas Land

Several big trade unions are seeking global accord for the protection of their members from the electronic spies of modern industry.

"There is nothing wrong with those technological wonders that boost productivity, tighten security or end boring work," concluded a study published by a United Nations organization in Geneva in response to the unions' demands. "The trouble starts when they are used to spy on workers, invade their privacy and divulge personal data to anybody who presses the right key."

Some enterprises have introduced card readers in place of door handles. To leave or enter their workplace, employees must insert their personal identity badges into an electronic slot. The stated purpose of the practice is the protection of sensitive in-

dustrial secrets. The process immeasurably increases the control exercised by the employer over the employees.

"The computer even knows when you go to the toilet," complained a trade union official at a recent conference.

A similar specter looms in offices where word processors can produce daily statistics showing the number of operations performed, the time worked, the number of errors committed and even project the capability of the human operators.

"Electronics spying on workers is bad, but at least it can be identified, and remedies exist on the collective bargaining shelf," according to a paper published by the U.N.'s International Labor Organization (ILO). "Invasion of the privacy of workers is a more serious matter. It is difficult to prove, and effective antidotes are still in a laboratory stage.

"Details of a whole life can be squeezed on a few centimeters of

tape. Hence the temptation, and the risk, to record personal information that is wholly irrelevant to the employer-employee relationship. Some data may be subjective, based on dubious sources or secretly recorded by an unauthorized person. However, once they find their way into computer memory, they are later treated as objective facts."

Several technologically advanced countries have recently adopted or tightened national legislation for the protection of privacy in the electronic age. An ILO survey noted that, although approaches vary, legal provisions usually cover such aspects as the purpose of personal data collection, access to computerized information and restrictions on its disclosure, the right of individuals to inspect their files and seek changes and penal sanctions for unauthorized use of data.

"Questions on the privacy of workers are increasingly being discussed at the bargaining table," ac-

cording to the ILO study titled, "Technological change: a tripartite response, 1982-85."

It goes on: "A pace-setting collective agreement was recently signed at a General Motors Corp. subsidiary in Austria stipulating the conditions under which the firm can deal with personal information on workers. It contains severe restrictions on disseminating employee data, some of which cannot be released without prior agreement by the trade union.

"Transnational information flows via satellites have added a new dimension to the problem, increasing the risks of misuse, unauthorized disclosure and even theft."

Earlier, the ILO advisory committee on salaried employees and professional workers passed a resolution inviting the UN organization to initiate a series of studies with a view to establishing a compendium of principles and practices for safeguarding the privacy of individuals at the workplace. Such an initiative would broaden the substance of union-management negotiations everywhere.

READER'S PLATFORM

Land is an author and foreign correspondent based in London.

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 **CONTROL DATA**

COMMUNICATIONS



DATA STREAM

John Dix
CW Senior Editor

Stop that PBX leak

Regardless of regulatory efforts to stanch the flow, private branch exchanges are leaking all over the place.

PBXs leak when they are capable of routing calls, which come in from remote office locations on dedicated lines, into the local telephone system.

A corporation in New York, for example, could run a dedicated line from its PBX to a PBX in a New Jersey facility across the border. Traffic destined for areas surrounding the New Jersey office could then be shuttled across that line and leaked into New Jersey Bell as a local call.

Dialing "81" establishes a connection to the New Jersey PBX, dialing "9" gets an outside line on that PBX and then the desired number can be dialed. But you don't have to do this manually. Most major PBX vendors provide software that does it automatically.

In practice, when a user dials a number local to the New Jersey complex, the system looks up the number and figures out if it is cheaper to route the call itself or send it across the border via the dedicated line.

The Federal Communications Commission frowns on this. To limit this practice, it developed a \$25 surcharge for private lines connected to switching or other types of equipment capable of rerouting traffic into the local exchange.

This charge is meant to compensate local telephone companies for access charges that leaky PBXs avoid.

Recently the FCC decided in favor of users who claimed local exchange carriers have been overzealous in assessing this \$25 surcharge. The commission issued a ruling clarification, saying local exchange carriers would have to repay

See **STOP** page 24

NEC rolls out Astra-TCMS

Cost management tool provides on-line accounting

By Paul Korzeniowski

BOXBORO, Mass. — NEC Information Systems, Inc. has announced Astra-TCMS, a communications cost management package that runs on NEC's Astra series of minicomputers and works with a variety of private branch exchanges (PBX).

Astra-TCMS, which can be used stand-alone or with NEC's Astra-Phacs telephone accounting system, enables users to maintain an on-line account of telecommunications equipment in use — such as telephones, cords, jacks, personal computers, modems and peripherals — and an inventory of equipment in stock.

The system can also be used to track what is known in the industry as equipment moves and changes, enabling users to keep tabs on relocated equipment. When a device is moved and the relocation entered into the system, the system automatically updates company directories of extensions.

Beyond equipment tracking, the software enables users to keep accurate records of internal cable runs, showing wire paths from a PBX through main and intermediate distribution frames down to individual extensions.

Key telephones — sets capable of answering multiple extensions — can also be tracked. Each extension followed under Astra-TCMS can have up to 32 keys or extensions. All lines and features are cross-referenced, enabling a user to print or display telephones sharing a common line appearance. Also, ring assignments, prime lines and usage can be entered.

The package can be used to generate reports showing the type and cost of telephones and other equipment used, class of service, station cable type, intermediate distribution frame setup, cable distribution data, spare-number assignment tables and operating parameters.

See **NEC** page 24

COMMUNICATIONS NOTES

Corning fibers win award

Corning Glass Works, Inc. has won a product engineering award from the National Society of Professional Engineers (NSPE) for its improvements in single-mode optical fibers. The NSPE said Corning had developed smaller, lighter and longer cables that improve the quality of transmission and reduce the need for repeaters and splices. Fiber optics for carrying voice, data and video signals are revolutionizing telecommunications, and the increasing demand for single-mode fibers has prompted Corning to double the size of its Wilmington, N.C., plant, the NSPE said.

Rolm Corp. announced recently that Rotelcom, Inc., its upstate New York distributor, will install a \$14.3 million

See **NOTES** page 23

E-mail growth slow but strong

By Paul Korzeniowski

The number of new subscribers added to electronic mail services will drop this year compared with last, but strong industry revenue growth is projected through 1995, according to two market research firms.

A study called "Computer Based Message Systems: 1985 to 1990," by Venture Development Corp., a market research firm based in Natick, Mass., divided electronic mail into two categories: internal systems used by one company and general services such as those provided by MCI Communications Corp. and Western Union Corp.

According to the report, 50,000 new customers subscribed to electronic mail services in 1984. That number will drop to 25,000 in 1986 before the market settles into a period of moderate growth through 1990.

See **E-MAIL** page 24

INSIDE

Users can monitor data on leased communications lines using an IBM Personal Computer or compatible micro outfitted with an add-on package from Renex/**23**

NEW THIS WEEK

- Sun Microsystems introduces Sunlink X.25
- General Electric Information Services enhances its Genie consumer information service
- For more on these and other new products, see pp. 87-122.

INSTANT ANALYSIS

"Part of the job of network vendors is to hide all operations, provide user transparency. When your doing your job right, no one can see you."

— William A. Lanfri
director of marketing
for Corvus Systems, a
personal computer
network vendor

Gammalink's micro-to-facsimile transmission product debuts

Gammafax includes adapter cards, software

PALO ALTO, Calif. — IBM Personal Computers and compatibles can be used to send textual and graphics material to facsimile machines using a new product from Gammalink.

Gammafax is a bundled product that includes two adapter cards — one, a Gammacomm 9.6K bit/sec. modem, and the other, an IBM Synchronous Data Link Control card — and Gfax software. The product enables a micro to communicate with any CCITT Group III facsimile machine worldwide.

Memos composed on an IBM Per-

sonal Computer, which can include text and graphics, are stored to disk as a DOS file and then compressed into the Group III format for transmission with Gfax. The compression time depends on the speed of the user's computer but typically runs 30 seconds to 2 minutes, according to Michael Lutz, marketing vice-president.

Once compressed, the text is ready for transmission. It takes about 1 minute to transmit a single page of text to a Group III digital facsimile machine, Lutz said.

Conversely, a Personal Computer with Gammafax can receive a compressed image from a facsimile machine, display it on a monitor or output it to a graphics printer.

The micro must be outfitted with either an IBM color graphics card or an IBM enhanced graphics adapter. Graphics programs for the micro, which are capable of writing in all-points-addressable mode to screens supported by either of these cards, can be transmitted using Gammafax.

In addition to opening up facsimile communications directly to personal computer users, Gammafax enables users to take advantage of facsimile machines as a new in-house resource.

Because Group III facsimile machines provide high-quality output, micros with the Gammafax package can use in-house facsimile machines as if they were high-resolution printers. The only drawback is the facsimile paper used, which is shiny and

probably not suitable for business correspondence.

Facsimile machines can also be used in the reverse direction as scanners. Documents or graphical material can be entered into the facsimile machine, read, compressed and stored as an image file. These files can then be displayed or printed using appropriate Gammafax software. Files cannot be manipulated.

Lutz anticipates that the system will be particularly appealing in foreign countries where imagery is an important part of communications, as in countries that use characters instead of letter alphabets.

Gammafax is available now for \$2,490.

— John Dix

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7	INSTALL PUMP
8	POUR FOUNDATION
9	INSTALL PIPE
10	ERECT TOWER



LEGEND:

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- SLACK TIME FOR A NORMAL JOB
- DURATION OF A CRITICAL JOB
- BREAK DUE TO HOLIDAY
- TARGET



SYSTEM

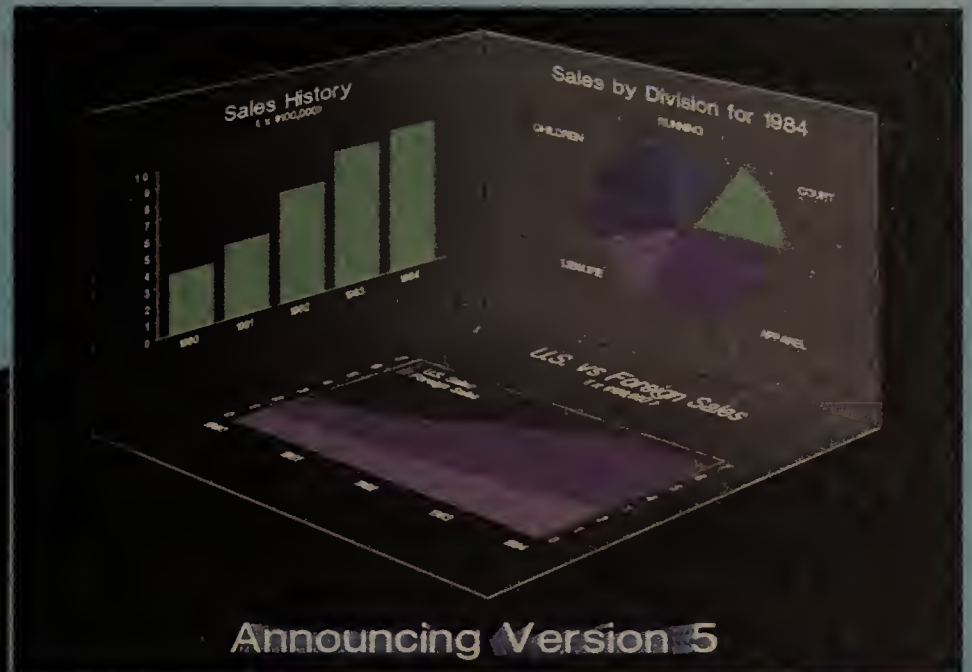
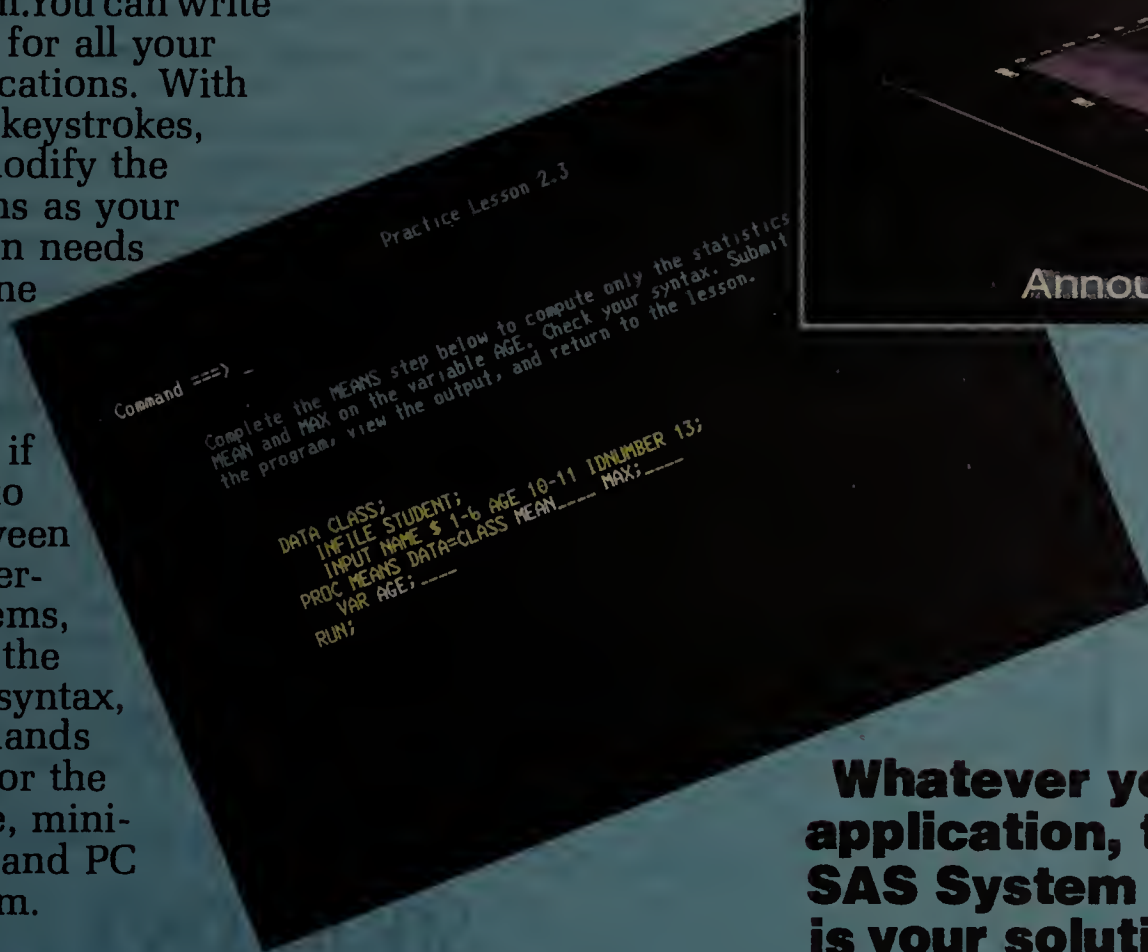
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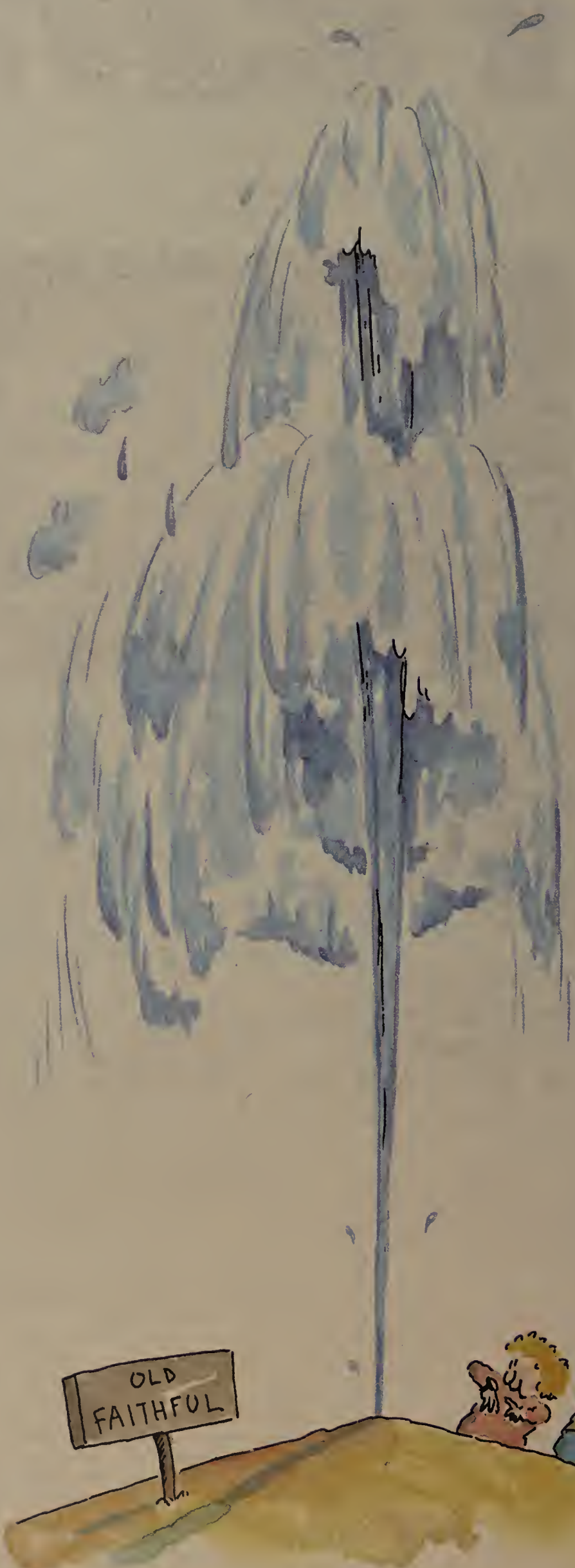
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COMMUNICATIONS

Renex monitoring unit debuts

By Paul Korzeniowski

WOODBIDGE, Va. — Users can monitor data on leased communications lines using an IBM Personal Computer or compatible micro outfitted with an add-on package from Renex Corp.

Datahawk includes a board that fits into an expansion slot of a micro — including the short slot of a Personal Computer XT or portable micro — a 48-in. test cable, software, a users guide and a function key template.

The menu-driven data scope is capable of monitoring asynchronous protocols, bit synchronous protocols like IBM's Binary Synchronous Communications and byte synchronous protocols such as IBM's Synchronous Data Link Control. It can also monitor X.25 links.

In use, Datahawk is inserted on a line between the data terminal equipment and a modem or digital serving unit. It can monitor a line, interactively test for problems, trap ASCII or EBCDIC data for further tests and print test results.

Tests include bit error-rate checking, block error-rate diagnostics, parity checking and character framing for asynchronous communications that use six, seven or eight data bits. Datahawk can also be used to test the performance of Cyclical Redundancy Checking-16 (CRC-16), as used by IBM, and CRC-CCITT, the international standard for this type of error checking.

While the tests are for data integrity, the general health of a communications line, such as noise level, can be deduced by analyzing the bit and block error rates.

All test results are downloaded to disk in standard ASCII format. The company does not offer any report generation capabilities.

Early next year, the company plans to offer a protocol analysis option for Datahawk that will enable users to examine the header fields of

synchronous protocols, according to Shane Clawson, director of sales and marketing. The option, made possible by adding a programmable read-only memory to the Datahawk board, will allow users to break down headers to examine things like synchronizing bits and address information. Typically, data scopes analyze only data within the data fields.

Clawson said the product is targeted at three markets: network suppliers, vendors of communications products such as protocol converters and users with medium- to large-size networks.

System requirements for Datahawk include an IBM Personal Computer equipped with 256K bytes of random-access memory, a double-sided disk drive and IBM's Version 2 or higher of IBM's PC-DOS operating system.

Datahawk, which is available four weeks after receipt of order, costs \$975.

Notes: NASA's radio speech unit

From page 19

Rolm system at the University of Rochester. The system is the single largest Rolm CBX II sold to date. It will include 15 nodes connected by fiber optics and microwave links and support 13,000 voice lines and 5,400 data lines, Rolm reported. An unreported number of the voice lines will also support simultaneous data transmission. The configuration will use Rolmbus 295 technology and feature automatic call distribution and route optimization. Rolm's Phone-mail will be available to 3,000 users initially. Installation was begun in October and is expected to be complete in early 1987.

A device that can reproduce intelligible speech over a radio channel with one-sixth the capacity of channels used with conventional radio telephones was recently demonstrat-

ed at a National Aeronautics and Space Administration briefing at the Jet Propulsion Laboratory in Pasadena, Calif. The so-called vocoder, presented by Allen Gersho, director of the Communications Research Laboratory at the University of California in Santa Barbara, reportedly "squeezes enough fat out of the spoken word to fit it into the extremely narrow radio channels that are still available in the crowded radio spectrum." The processed voice is said to sound slightly degraded but still intelligible.

The work is said to be part of a broader NASA effort to develop a mobile communications system available in all areas, not just urban areas. The system will be satellite based and require the development of small, lightweight antennae. But the largest technological hurdle is said to be the development of a vocoder that can reproduce near-toll-quality speech at 4.8K bit/sec. and be mass-produced for less than \$100. Against these goals, Gersho rated the quality of the laboratory's vocoder as "not bad" at a "tolerable" price.

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COMMUNICATIONS

E-mail growth slow but strong

From page 19

Competition from multifunction office automation vendors and user disappointment in services are two reasons for the decline in the number of new subscribers captured, the survey noted. Another reason is that Western Union and MCI added a number of subscribers to their respective services — Easylink and MCI Mail — in 1984, establishing artificially high growth rates for that period.

Also, several services supply capabilities for only one type of equipment, and this hinders widespread acceptance. The survey predicted

that AT&T may soon enter the market and establish electronic mail standards.

While growth in new subscribers has abated, service vendors may increase their revenue by encouraging current users to send more messages, according to the study.

The Venture Development study costs \$1,850.

Business Communications Co. a research company located in Stamford, Conn., is bullish on revenue growth for electronic mail. The survey, "The Electronic Mail Revolution: Implications for Users and Suppliers," concluded that "several important factors will quickly converge to move this technology forward at a very explosive pace."

The number of electronic mail transactions carried by the commercial service providers such as MCI

and Western Union is expected to grow at an annual rate of 62% between now and 1995, according to the survey. In 1985, 120 million mail transactions were supported, a figure that will grow to 6.1 billion in 1990 and 15.1 billion in 1995.

The total number of electronic mail transactions — taking into account mail handled by corporate in-house systems and missives transmitted from home computers — will grow from 360 million in 1984 to 24.9 billion in 1985 and 64.9 billion in 1995, according to Business Communications.

"Measurable revenue from electronic mail processed through the commercial service providers will increase from \$250 million in 1985 to \$11.5 billion in 1995, an average annual rate of 47%," the company said. The report is available for \$1,500.

NEC rolls out Astra-TCMS

From page 19

Astra-TCMS was designed to complement Astra-Phacs, a NEC package that supplies station message detail reporting and traffic management reporting.

NEC Information Systems claimed that more than 1,000 Astra-Phacs have been sold.

When used together, information reportedly can be shared between the two packages, including data on tenants, divisions, departments, extension numbers, directories and cost allocation.

Data base diagnostic facilities enable tests to be conducted for inconsistent and missing data that ensures record accuracy, the company reported.

The \$8,500 Astra-TCMS software is available immediately, the company said.

Astra-TCMS runs on an Astra system with 512K bytes of random-access memory.

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Stop that PBX from leaking

From page 19

customers the surcharge if the customers filed an exemption request.

The actual existence of leaking PBXs is, after all, hard to detect and police. The capability exists in software. Local telephone companies have little way of telling if the calls they accept originated at the switch site or at a distant switch location.

As it turns out, however, it isn't so easy to tie PBXs together in the first place.

Typically the facilities used to interconnect PBXs are so-called tie lines or tie trunks. Tie trunks are one of the more complicated things in voice communications. This is because you run into terrific problems of matching signal levels on different switches, which may be of different brands.

Even before the AT&T divestiture, when the phone company was providing both ends and the middle of a circuit, there were frequently problems making tie trunks work properly. Echo and other problems result from signaling and transmission snafus between switches.

Foreign exchange (FX) lines, where one end connects to your switch and the other end connects to a local exchange company's central office switch, are easier to implement than tie lines. While they don't give you the same capabilities as a tie line, sometimes they can be used in a similar fashion. An office, for example, can use an FX line to leak traffic into a frequently called exchange, rather than pay for each individual call to that exchange.

It is clearly in the interest of telephone companies to stop PBXs from leaking and do whatever else needs to be done to keep local revenue. But it is equally clear that ambitious users will continue to search for loopholes in tariffs in an effort to keep a rein on escalating communications costs.

SOFTWARE & SERVICES



IBM spotlights restructuring

IBM has a knack for bringing issues to the forefront.

A case in point is the recent introduction of the Cobol Structuring Facility (Cobol/SF), a tool IBM claims will automatically transform users' old, tired Cobol programs into easily maintained, structured programs. (Readers may relax. The author has foresworn the use of the phrase spaghetti code to describe unstructured programs. It is a grating term that should be discarded before it gains wider acceptance.)

Cobol/SF's capabilities aside, IBM has brought the issue of code restructuring into the spotlight. Before IBM's entry into the fledgling market, a handful of considerably smaller players were working diligently to convince maintenance-besieged DP managers of the benefits of code restructuring. With IBM's blessing, it seems clear that the concept will get more attention now.

Gordon Gossage, director of marketing for Language Technology, Inc., a Salem, Mass.-based company that offers both a restructuring service and product, said DP managers are interested in the idea of code restructuring — that is, once they hear about it.

Gossage said his company recently hosted focus group sessions with DP professionals, and several underlying themes became clear. Above all, DP managers emphasized that maintenance has become an onerous task — one that consumes as much as 75% of some shops' resources. They said poorly written, unstructured programs developed in the past are the main source of their maintenance woes, and they agreed that structured programming techniques will reduce future maintenance requirements.

What the majority didn't know, Gossage said, was that tools and services exist that purport to unravel unstructured code and, therefore, reduce current maintenance work loads.

"Restructuring is a new idea," Gossage said. See **IBM** page 30

IBM's CPF Release 7 receives praise from users

By John Desmond

The enhanced IBM System/38 operating system, CPF Release 7, now widely installed after deliveries began in September, has been well received by users.

Gene Gellman, director of information services at Cyro Industries of Sanford, Maine, said Cyro had Release 7 installed on its two System/38s in mid-October. The upgraded release of the operating system was announced last summer [CW, June 24] when IBM moved to make the System/38 a key component of its office systems network. Gellman said Cyro is happy with the new release's support for IBM's Systems Network Architecture Distribution Services, which enhances communications between the two processors.

In addition, Gellman said the Join function added to CPF in Release 7 has aided Cyro's programming efforts. The Join operator allows two physical files to be joined together in any field to create one file. "We find the Join function to be phenomenally effective. It's saved us hundreds of lines of application code." A bill of materials application that pulled data

from various physical files was done in half the time it would have taken without the Join operator, said Gellman.

"Another feature we think is nice is the ability to display a job log, so if you have a problem, you don't have to kill a job," he said. In the past, if a program encountered a problem during execution, the job had to be canceled. Now, the problem can be ascertained and remedied while the program is running.

Asked to make a comparison between the System/38 data base management system (DBMS) and those of independent software vendors, Gellman said, "The System/38 relational data base lacks two key things: one is a good data dictionary, the other is update capability with Join." Files created with the Join operator are read only; updates must be made on the physical files used to create the joined file, Gellman said. Days after Release 7 was installed at Cyro, the company suffered a head crash in one of its IBM 3370 disk drives. Cyro discovered that the process of restoring the system after a head crash is

See **CPF** page 29

Ingres DBMS Version 4 out

By John Gallant

ALAMEDA, Calif. — Relational Technology, Inc. is expected today to release Version 4 of its widely used Ingres system. The announcement comes just two months after the company introduced an IBM VM version of the relational data base management system [CW, Sept. 30].

According to a spokesman, Version 4 of Ingres supports distributed access to all Ingres data bases in a network of dissimilar computers running Ingres under AT&T's Unix and Digital Equipment Corp.'s VMS operating systems. Relational Technology earlier provided distributed processing support among similar operating environments with the release of its Ingres/Net product two years ago.

Ingres now supports both the Quel and IBM SQL query languages within the VMS and Unix environments. The spokesman

See **INGRES** page 29

Sequent enhances Dynix operating system for Balance

By Donna Raimondi

BEAVERTON, Ore. — Sequent Computer Systems, Inc. has announced enhancements to its Dynix operating system and a series of parallel programming tools for its Balance computer systems.

The enhanced version of the Dynix operating system features both AT&T's Unix System V and University of California at Berkeley's Unix Version 4.2 capabilities. The vendor claims that Dynix 2 will run applications on the Sequent Balance 8000 parallel processing machine up to 45% faster than the previous version.

The programming tools support the development of parallel applications in C, Fortran and Pascal and include a parallel debugger, enhancements to the company's parallel programming library, a perfor-

See **SEQUENT** page 30

NEW THIS WEEK

- Britz Publishing announces five desk accessories for IBM System/34 and 36
- Charles River Data Systems upgrades its Unos operating system

■ For more on these and other new products, see pp. 87-122.

INSTANT ANALYSIS

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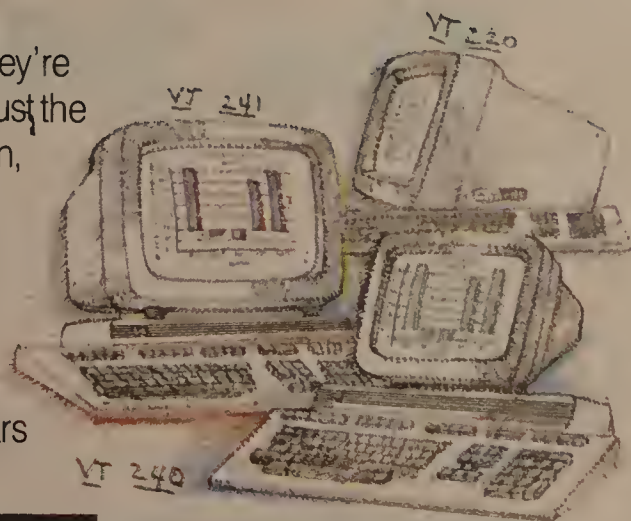
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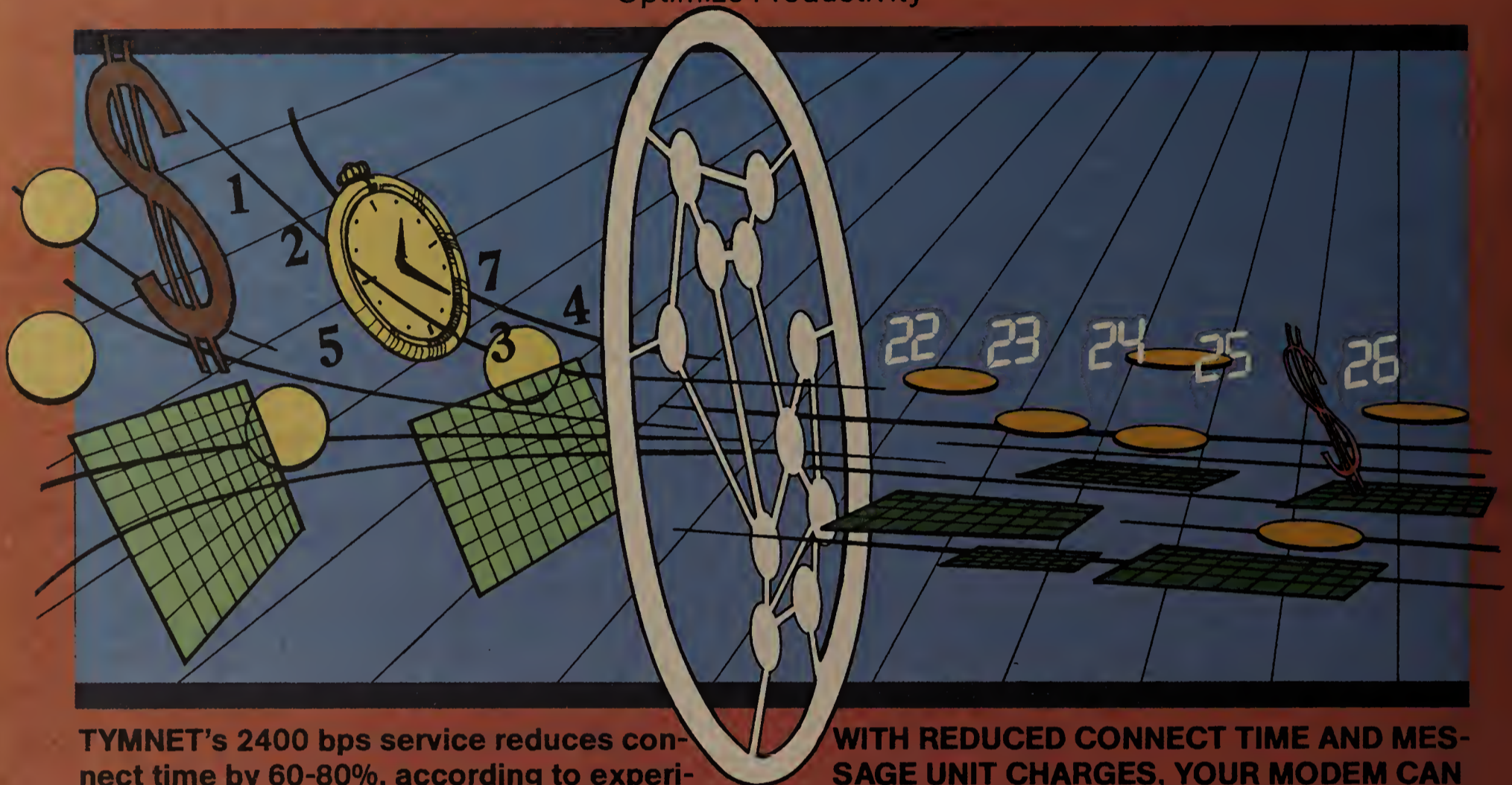
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SOFTWARE & SERVICES

CPF Release 7 receives praise

From page 25

more involved with CPF Release 7 than on previous releases. "We had some serious problems bringing back the logical and physical files because the access paths were not being restored properly," Gellman said. (The access path is a binary index to the records and fields of physical files.)

A restoration, essentially a recompiling of programs, that previously would have taken six hours took 18 hours. IBM did send out a program change fix that seems to have resolved the problem, Gellman said.

The 3370s are attached to System/38s in a single-level architecture, which means when one drive fails, "the whole system goes down because data is scattered throughout," Gellman said. Data must be restored from backup media. On a 4300-class mainframe, one failed drive will not bring down the system. Gellman noted that IBM is trying to find a solution to the problems surrounding 3370 failures.

'Pushing for the Join function'

Robert C. Nixon, a systems analyst with The Way International of New Knoxville, Ohio, a Biblical research fellowship and teaching organization, also had Release 7 installed in mid-October. "We've been pushing for the Join function for five years," Nixon said.

The Way has a data base of names and addresses that goes back to System/3 days, previous to System/38's release. A total of 500 programs now access the data base, though only 14 can perform updates.

Functions and users were continually added until the data became a "hodgepodge that was very difficult to merge and expand," Nixon said. "We wanted to get it into better relational structure, but we wanted to keep the existing programs the way they are."

Using the Join operator, The Way is breaking up the data into name, location and participation records. In a major undertaking, all new development at The Way will be based on a new version of the old data base.

The Way plans to buy Personal Services/38 and Personal Computer

Support/38, also announced in June. Personal Services/38 enhances System/38 communication with other IBM products including the System/36 and the Distributed Office Support System. Personal Computer Support/38 supports the exchange of data between IBM Personal Computers and System/38.

Nixon is anticipating using Personal Computer Support/38's dynamic Join feature that allows personal computer users interactively to set fields and records needed to create a joined file. "We're excited about it as a development tool," said Nixon of Personal Computer Support/38. The company has six Personal Computers among a total of 50 devices attached to its System/38.

The communications enhancements in Release 7 make the option of bringing in a System/36 to handle

The Way's word processing tasks an attractive one, Nixon said.

The department now performs word processing on IBM 5520 terminals with limited communications abilities.

Man-years required cut in half

Nixon projects that Release 7 will cut in half the previously estimated four to eight man-years required to modernize its data base. "And we're adding a level of sophistication and function we never had before," he said. "Routine requests [that] we'll handle with Join we would have refused to handle before because it would take too much work."

Like Gellman at Cyro, Nixon hopes a data dictionary with editing capabilities will be added to System/38's relational DBMS. And he hopes IBM SQL-like commands for accessing the

data base and a good report writer will also be offered. IBM is receptive to adding the enhancements, Nixon said.

"The whole idea of implementing Join opens up all kinds of other areas to go into," Nixon said. If IBM takes System/38 in the direction Nixon advocates, the System/38 relational DBMS and tools will eventually closely resemble those offered in the fourth-generation language products offered by independent vendors.

"We'd like to see IBM continue to build the functions into the system, instead of each user having to build it into the system," Nixon said.

While he expected System/38 to be a strategic machine for IBM in the 1980s, his impression from attending a recent IBM users meeting is that, "IBM is looking for System/38 to go into the 1990s."

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Ingres DBMS Version 4 out

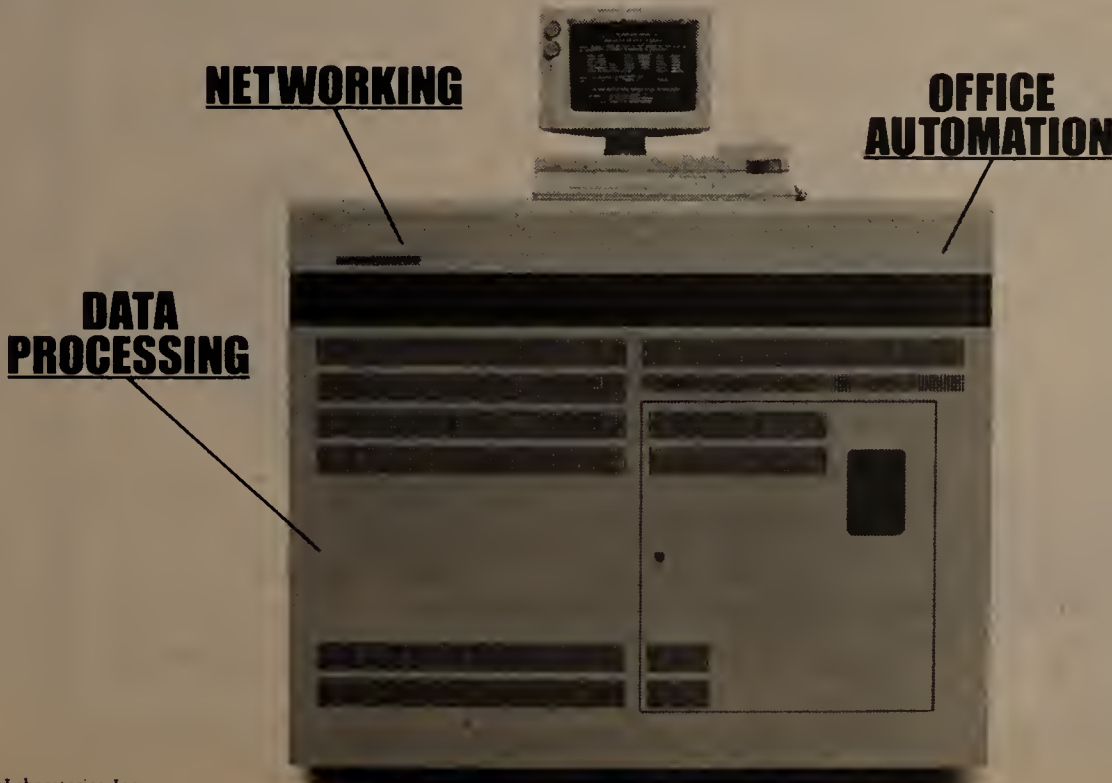
From page 25

said Relational Technology's implementation of SQL is compatible with IBM's DB2 relational data base management system and offers extensions such as international date and money data types.

Also, the spokesman said, Ingres' performance for most applications has improved, on average, by 40%.

Version 4 features enhanced applications development tools such as function keys that allow users to enter commands with one keystroke.

Volume shipments of Version 4 are scheduled for February. Ingres is priced between \$7,500 for the DEC Microvax II to \$90,000 for IBM mainframes under VM/CMS.



SOFTWARE & SERVICES

IBM spotlights restructuring

From page 25

sage said, "and people are skeptical. Users don't believe an automatic restructuring solution is feasible. We spend about three-quarters of our time convincing prospective customers that the technology works. The IBM announcement has brought the issue to a higher plane. IBM is saying, 'This solution is feasible.'"

According to Gossage, success for the new products rests on how much user intervention is required to complete the restructuring process. He said Language Technology's Recoder system can automatically restructure any IBM Cobol program — no

matter what shape it's in. That is not the case with other products, Gossage claimed, notably IBM's.

"Cobol/SF's analysis mode identifies the program sections the product cannot automatically restructure," he said. "Manual restructuring is a very difficult process. At a recent Guide [IBM users group] meeting, IBM recommended that users put their best programmers into the restructuring effort with Cobol/SF."

Pander to users' fears

But the most important question may be whether restructuring is really the answer to the current maintenance overload or whether, as some critics have claimed, the products simply pander to users' fears of maintenance.

Gossage and the other restructuring pioneers said they sincerely be-

lieve that restructuring is the answer. He said a number of studies have shown clearly that unstructured code is two to three times more expensive to maintain than structured code.

"Restructuring does not replace the need to write new programs using structured techniques," Gossage said. "But when it comes to existing programs, users don't have a lot of alternatives."

"Stay with the current approach, and the maintenance task will get worse and more expensive. Or you can totally rewrite all your systems in structured code. That costs anywhere from \$10 to \$30 per line of code."

"The third alternative is to restructure. We charge, for example, between 10 cents and 50 cents per line of code. That is the most cost-

effective approach. You can see a payback in the first year," Gossage said.

With IBM's help, Gossage said, 1986 will be the year in which the concept of restructuring takes wing — in a market sense, that is. "We estimate that there are 77 billion lines of Cobol code out there, and two-thirds of them are unstructured. Between us and IBM," he said, "1986 will be the takeoff year for restructuring."

Certainly, the maintenance issue is a hot one and if any company can focus attention on an issue, it's IBM. But the restructuring vendors will have to educate a lot of users on the capabilities of restructuring technology, and that takes time. Whether the concept will win over a large camp of users next year remains to be seen.

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IMS DP SOFTWARE STRATEGIES

Sequent enhances Dynix, Balance

From page 25

mance monitor and a software generation system.

All of the tools will be available as part of the Balance 8000 system software, with all but the debugger being shipped with Release 2 of the company's Dynix operating system later this month. The debugger is scheduled to ship in the first quarter of 1986.

The debugger, dubbed PDBX, allows a programmer to debug multiple processes as if they were one. When an individual process or combination of processes reaches a predefined condition, any or all processes can be stopped and examined. Its command interface is an extension of the DBX debugger, which operates with Unix 4.2.

An added barrier function in the parallel programming library provides for synchronization of multiple processes. A barrier provides the programmer with a common stopping point for groups of processes that all must satisfy some condition before any can proceed.

Also, a shared memory facility in the library, based on a mapped file model, supports paging of shared memory. It lets the programmer declare multiple independent shared memory regions that can be larger than physical memory.

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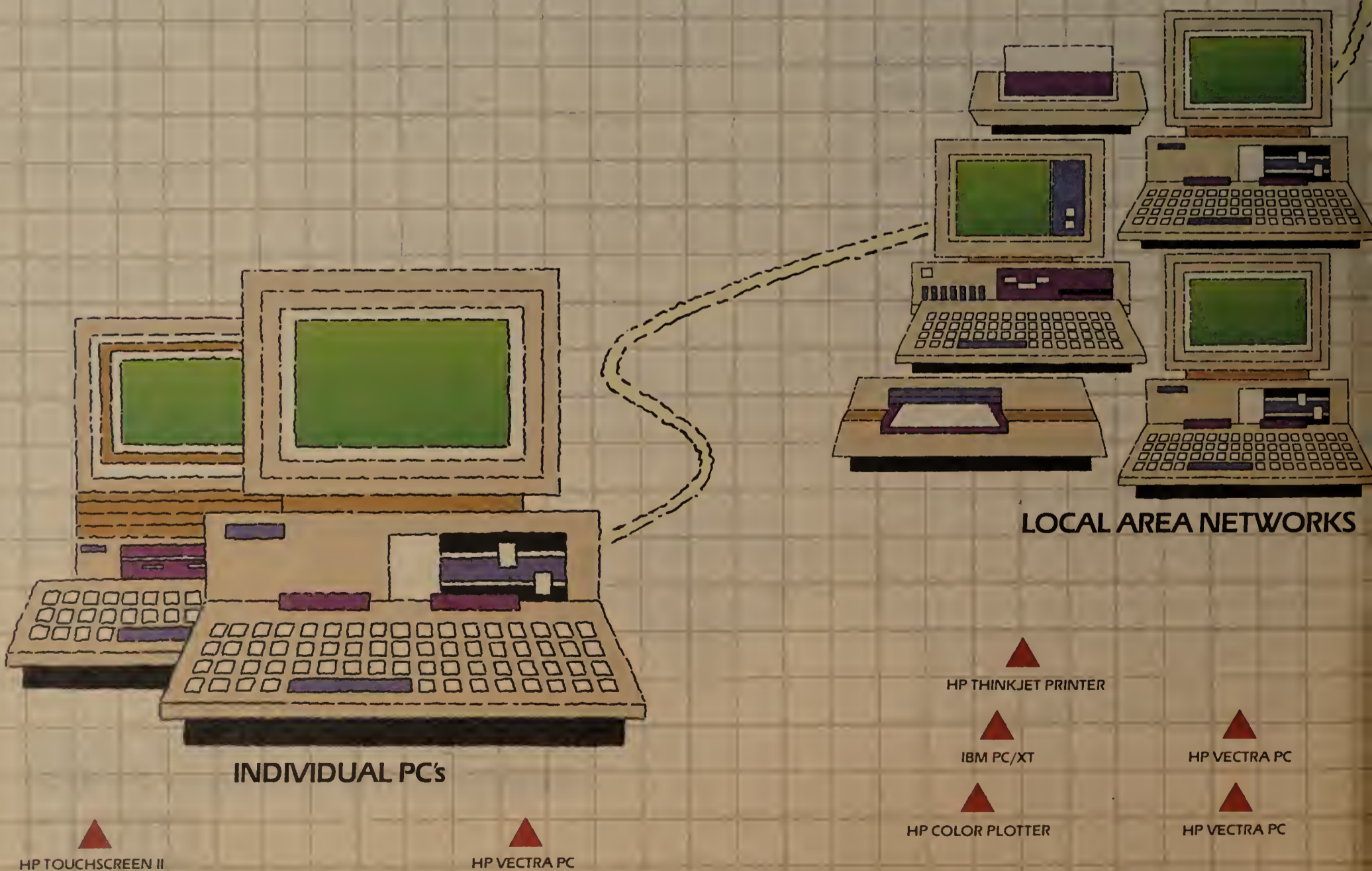
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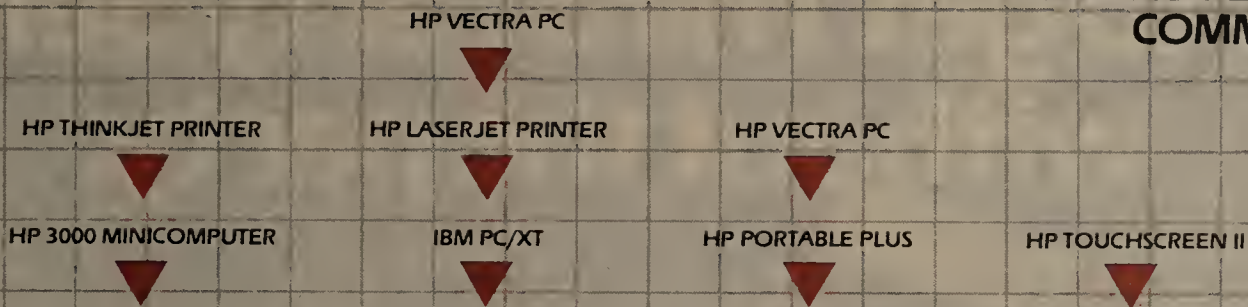
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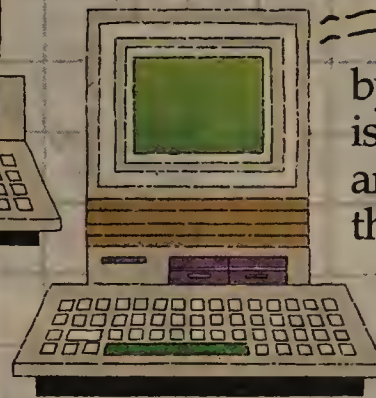
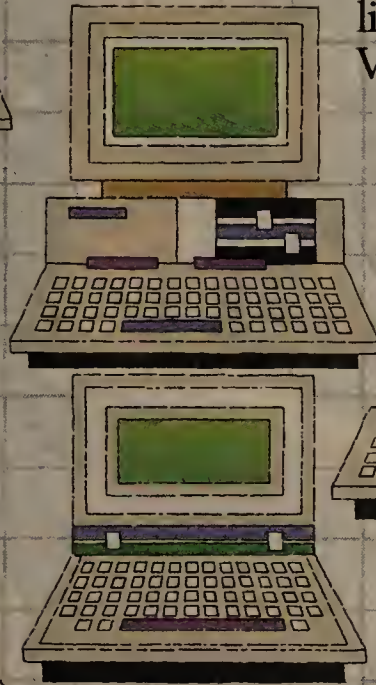
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SYSTEMS & PERIPHERALS



HARD TALK
James Connolly
CW Senior Editor

PDP-11 marks 15th year

In an age when computer companies disappear before their products reach the market and products are obsolete before they are delivered, the fact that a product passes an anniversary can be notable, if not newsworthy.

Therefore, it may be more than noteworthy that a group of products in the dynamic processor market has made it to its 15th anniversary, which is the crystal anniversary for those who adhere to traditional gift-giving practices.

Richard Nixon was president, and the IBM 360/195 was a star in the mainframe world when Digital Equipment Corp. introduced the PDP-11 family of minicomputers. Most 360s long ago went to the junkyard, and Nixon is arbitrating baseball disputes, but the PDP-11 is hanging in — even thriving in some markets.

"It is a fabulously successful machine, perhaps the most successful machine of all time," said Boston-based consultant and DEC-watcher Sonny Monosson. "There are over 500,000 [PDP-11s] out there, so many that even if DEC wanted to replace them all, they couldn't produce replacements fast enough."

The PDP-11 has been written off as doomed several times, usually by boosters of DEC's own VAX-11 series or by users who may be wary of 15-year-old technologies. It not only has survived but continues to be enhanced, most recently with DEC's addition of the Micro/PDP-11/83.

The original family member, PDP-11/20, bore little resemblance to today's PDP-11s and Micro/PDP-11s. The boxes and the boards have been replaced by smaller boxes and microprocessors. Some systems still need computer-room-type power supplies, but most PDP-11s are available in desk-side office versions. Some versions still use DEC's Unibus, while others have moved to the Q-bus.

However, the basic instruction set
See **DEC** page 39

Options for 3090 users

Power supply alternatives to IBM recommendation

By James Connolly

The IBM specification for supplying power to its 3090 mainframes is being short-circuited by some customers who have found ways to save up to \$60,000.

While IBM officials have reported no signs of fall-off in sales of its 3089 Power Unit in conjunction with 3090 Model 200 sales, some 3090 customers have turned to other vendors who supply products needed to retrofit existing power supplies to support the 3090.

At issue for some customers interviewed since 3090 installations began is IBM's recommendation that customers install two 3089s, priced at about \$38,000 each, for each 3090 Model 200 and four 3089s for each Model 400 scheduled for delivery in late 1986.

The owner of a Newport, R.I., electrical service and consulting firm said that his firm is one of several throughout the U.S. offering products and services that allow 3090 users to utilize the existing 3089 or

whatever power supply was used with the IBM 3080 series or 3030 series processor that is being replaced.

"IBM has a nice [3089] box. It runs well, is designed well and holds up as well as anybody's. There is no problem with it except it costs too much," said James H. Clausen of A. P. Systems, Inc. in Newport.

Clausen said IBM officials have told him they require the two feeds because a single 44-kVA feed from a 3089 comes close to exceeding the 125A rating of the connector to the 3090's power and coolant distribution unit, the 3097. He speculated that it is only a matter of time before IBM replaces the 3089 with a power supply designed specifically for the 3090. Meanwhile, he and several other vendors are offering attachments such as a splitter — in Clausen's case a product known as the Multiple Distribution System (MDS) — which breaks the single feed from an existing power supply into two feeds. Some of those alternatives fit under the computer room floor, while others were designed to fit in cabinets.

One customer that installed the A. P. Systems MDS is Sebouth Asadourian, man-
See **USERS** page 39

Gruner discusses Alliant, FX/8

By Donna Raimondi

The word "alliant" — an early French version of the word alliance — means a mutually beneficial relationship. It aptly describes the type of company that Ronald H. Gruner and his two associates founded in 1982.

Alliant Computer Systems Corp. builds parallel processors for the scientific and engineering marketplace. "The appetite for computation [in that market] is almost insatiable," he said. "If you can sell faster machines — if they are available — they will take them. They require them."

The company, which provides low-end supercomputing power to that market segment, will have installed about 10 of its FX/8 parallel minisupercomputers by the end of 1985. It recently signed a \$35 million deal with Apollo Computer, Inc. for its processors to act as servers in Apollo Domain networks.

During a recent interview in his office

Gruner talked about the growing company and how it began.

The technology for the Alliant FX series machines — said by parallel computer technology analysts to be the only commercial machines actually doing parallel computing — was not a flash of brilliance from a mad scientist dedicated to the search for truth and beauty in machinery. It was the result of a calculated search by the Alliant founders: Gruner, the president; Rich McAndrew, vice-president of engineering; and Craig Mundie, vice-president of software. They sought a technology that was different from what was on the market and that would be salable,

Gruner said.

"We quickly came up with the idea that if we could commercialize parallel processing — in other words, develop a system that would truly run existing software — and increase the performance of the sys-

See **GRUNER** page 37



Ronald H. Gruner,
president, Alliant

INSIDE

Point 4 Data enters the supermini marketplace with its Mark 12 system/**36**

Wang Laboratories offers a mid-range system for its Office Information System product line/**36**

Inner Access unveils its Noel eight-user supermicro/**39**

NEW THIS WEEK

- The Automation Group announces the MDL-22 data acquisition device
- Hewlett-Packard introduces two hard disk drives

■ For more on these and other new products, see pp. 87-122.

INSTANT ANALYSIS

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— Consultant Sonny Monosson on the DEC PDP-11

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SYSTEMS & PERIPHERALS

Wang pumps up mid-range OIS family

By James Connolly

LOWELL, Mass. — The Wang Laboratories, Inc. Office Information System (OIS) product family, which has been rumored to be doomed despite the company's promises of future enhancements, recently received a mid-range addition.

Wang introduced the OIS 70, a 12-user system that is intended to provide an upgrade path for users of the four-user OIS 60 and the eight-user OIS 50.

The OIS 70 was designed to handle text editing and office automation in small and medium-size departments and businesses. It is compatible with all other OIS systems, the vendor said.

Fits into virtually any office

Wang said the system fits into virtually any office. It features a 5¼-in., 67M-byte Winchester disk drive with a 28-msec access time and a 5¼-in., 320K-byte diskette drive.

It supports combinations of up to 17 peripherals, 12 of which can be terminals, including Wang 4200 series workstations and Wang Professional Computers.

Wang said four of the terminals can be low-cost OIS Internal Workstations.

The company also said a field upgrade from an OIS 50 or OIS 60 requires no document conversion or operator retraining.

Standard software reportedly includes Wang word processing with functions such as Wang Glossary for retrieving standard words and paragraphs, Wang Decision Processing for automating word processing commands and Wang Math Support Package for common mathematical functions.

Optional application packages

Optional Wang application packages include WP Plus text editor, List Processing, Spelling Verifier and Readability Analysis.

Available data processing functions include Wang Office Basic or Digital Research, Inc. CP/M operating system.

Communications resources include Wang's Wangnet local-area network and Fastlan, a user-installed version of Wangnet.

As an option, OIS 70 supports Wang Inter System Exchange, which permits links between new and current OIS systems for sharing peripherals, software and documents, according to the vendor.

The OIS 70 was announced less than two months after Wang executives told a Wang users group meeting that the company would continue to support and enhance the OIS line, in contrast to industry speculation that OIS would be phased out. However, one analyst still termed the OIS 70 as an "end of life kicker" for the product line.

The OIS 70 is scheduled to be available in January. Prices for the product will start at \$12,000 for a system with the 67M-byte hard disk drive.

Point 4 Data launches Mark 12 supermini

System targeted to vertical industry markets

By James Connolly

IRVINE, Calif. — Point 4 Data Corp., a 7-year-old minicomputer maker, has introduced its first superminicomputer, a system that the company said provides five times the performance of its previous high-end computer.

The Mark 12 has a 16-bit CPU but is based on a four-stage pipeline architecture and a 32-bit bus that operates at 33.3M byte/sec. in support of up to 16M bytes of extended memory, according to a company spokesman.

The Mark 12 reportedly features a 64-nsec instruction executive cycle time and performs between 7.5 million instructions per second (MIPS) and 15 MIPS, the vendor claimed.

Like other Point 4 products, the Mark 12 will be distributed only through value-added resellers that target vertical industry markets such as the medical field and the construction industry.

Available now, the Mark 12 reportedly supports a physical maximum of 100 ports, although the company said a realistic number of users would be 50 or 60 in typical accounting or office automation applications.

The Mark 12 uses a single 15-in. board with 128K bytes of main mem-

ory. A basic configuration, including an 84M-byte disk drive, a ¼-in. streaming tape and an eight-port multiplexer, costs \$42,430, the vendor said.

The Mark 12 is being added to the high end of Point 4's product line, above the 2-year-old Mark 9.

The company said it continues to offer the previous products.

One current Point 4 user, Robert Eller, computer operations manager for Louis Patnos Iron & Metal Co. in Holland, Mich., said of the product, "We're very anxious to see it. We have been running a Mark 9, which is now the top of the line. But as we keep growing, we keep looking for something to handle that growth."

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SYSTEMS & PERIPHERALS

Gruner discusses Alliant, FX/8

From page 35

tem by simply adding additional processors, that would potentially be a major new idea in computing," Gruner said.

Gruner was no beginner in the world of processors. He spent 13 years developing processors for Data General Corp. In Tracy Kidder's book *The Soul of a New Machine*, which told the development story of DG's FHP computer, Gruner was an antagonist, called the "North Carolina leader." Although the product developed at that time never went to market, he helped design processors for DG's Nova series and the Eclipse MV/

80000, MV/4000 and MV/10000.

When he and his associates founded Alliant, "We spent a lot of time at the MIT library," Gruner said. They went through 2-ft-thick stacks of books and papers at a time to determine who understood how to perform parallel processing with existing software rather than throwing away the software and starting over.

In most of its study, the group reached the conclusion that parallel processing could not be done with existing computer structures, existing languages or existing applications. "We felt that [starting over] was not commercially viable," said Gruner.

But researchers at the University of Illinois had written papers as far back as 1973 applying parallel processing to ordinary programs. One of those papers, coauthored by David Kuck, developer of the university's

Cedar supercomputer project, sparked Mundie and Gruner to learn parallel processing directly from Kuck in Illinois. "We came away saying, 'We think we can commercialize this,' and that's what we began doing," Gruner said.

Fostered symbiotic relationship

"We have been very aggressive in trying to identify the ideas that were developed in Illinois that we thought were commercially exploitable," Gruner said. "We have worked hard to develop a symbiotic relationship between that academic perspective and our commercial perspective."

True parallel processing includes the application of multiple computers to the execution of a single computationally intensive program, Gruner stated. "If you have a program on one computer that runs in

eight hours, and if you add three additional computers for a total of four, the thing would run in two hours," he said.

Alliant's FX/8 parallel processor looks at a Fortran program, identifies what parts of the program can run parallel, what can be vectorized and what must remain scalar. DO loops in Fortran, which are generally a large part of a Fortran program, are the only parts of the program that can run in parallel at this time.

What makes it possible for Alliant to claim parallel capabilities, Gruner said, is a combination of the FX/8's compiler, its hardware architecture and the design of the operating system. The compiler identifies opportunities for parallel execution and generates efficient code for execution, Gruner said. It was developed jointly by a team at Alliant, the Massachusetts Computer Associates in Wakefield, Mass., and the Pacific Sierra Research Corp. in Placerville, Calif., a company whose usual business is to apply existing programs to supercomputers. Kuck acted as technical consultant.

Alliant's hardware architecture, if viewed as a circle, starts with memory at the core, cache memory around the core and processors surrounding the memories, Gruner explained. The up to eight processors on the top half of the imaginary circle are called computational elements. These are the processors that operate on computationally intense programs. The up to 12 smaller interactive processors on the bottom half of the circle execute the operating system, manage the file system and run nonparallel programs such as text editors. Alliant's Concentrix operating system coordinates all of the processors.

Alliant's founders went after the engineering and scientific markets partly because members of those communities are likely to adapt early to new technology, Gruner explained. "If you look at the last 30 years, all of the major computer companies with few exceptions initially focused on the scientific and engineering marketplace," he said. Parallel processing is applicable to that market also, because scientific users are most apt to do computationally intensive tasks like modeling or simulating physical phenomena.

Expects competition from IBM, DEC

Gruner expects strong competition from companies like Digital Equipment Corp. and IBM. Alliant's product plan and strategy assumes that fact, and the company is working to leave its role as a niche player to become a long-term, viable, general computer manufacturer. "For the foreseeable future, we will always be focused on engineering and scientific applications," he stated.

The company identified, in its first business plan, what Gruner calls a major opportunity in the OEM sector — to provide a high-performance computational server to firms selling workstations in the \$5,000 to \$70,000 range. The plan has resulted so far in the multimillion-dollar deal with Apollo.

Gruner will not talk specifically about where the company plans to go from here. It is working on more OEM deals and on an Alliant sales and services organization that will directly market to end users. The market for machines like the FX/8 should reach \$1 billion by 1990, Gruner said, and he wants to cash in on that market.



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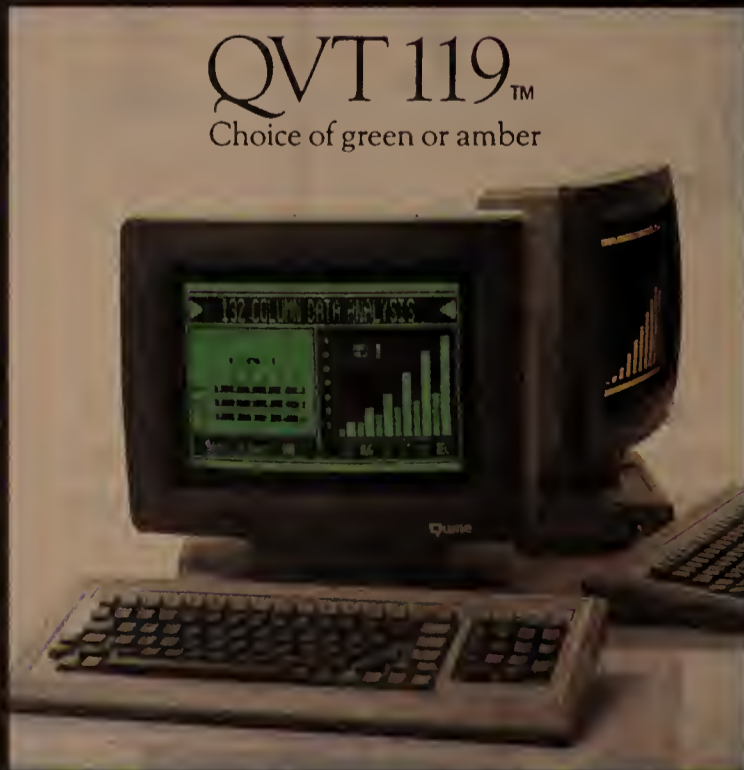
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SYSTEMS & PERIPHERALS

Inner Access unwraps Noel

By Donna Raimondi

BELMONT, Calif. — Inner Access Corp. has unwrapped Noel, a \$4,999 expandable eight-user supermicro-computer.

Noel is the company's second computer and its first small-scale system, spokesman Gary Feierbach said. "We are going head-on with the [IBM Personal Computer AT] and that size computer," he said. Inner Access sees its market for Noel as a file and print server in corporations that have terminals and personal computers with terminal emulation capabilities.

The Motorola, Inc. 68000-based machine contains 512K bytes of random-access memory that is expandable to 2M bytes in the chassis and up to 16M bytes in an expansion chassis. If the memory is increased to 1M byte in the factory, Feierbach said, the price jumps by \$700. If increased to 2M bytes in the factory, it costs an additional \$1,199. Memory can be upgraded after the customer owns the machine, but the cost will be higher.

The system includes a 20M-byte hard disk, expandable to 120M bytes in the chassis to several gigabytes in an expansion chassis.

A 1.2M-byte floppy disk is expandable to 2.4M bytes in the chassis, and the eight RS-232C I/O ports can be increased to 64 channels in an expansion chassis.

DEC PDP-11 marks 15th year

From page 35

remains 15 years later, providing the compatibility and migration paths that DEC has emphasized in its marketing efforts. The PDP-11 family is one that is sold with the promise that software designed for one PDP-11 system will run on other PDP-11s. DEC's product manager for the PDP-11 line, Abbot Gilman, noted recently that that promise has been a key to the PDP-11's success.

The original PDP-11 was targeted toward real-time markets such as communications, process control and laboratory data acquisition — markets that DEC still seeks to address with the 16-bit systems.

But early success for the PDP-11 fueled later success. "In terms of success, I think one of the reasons is the installed base, which has developed a fairly complex set of applications over the years," Gilman noted.

He also argued that the VAX-11 series is no threat to the PDP-11 and that they complement each other in serving different markets.

Without discussing future product directions, Gilman promised that further enhancements are still to come.

The PDP-11 remains a survivor. It is a competitor in a battle where microcomputers are driving up at minicomputers and superminicomputers are driving down. It is surviving despite being told it was dead, and it will survive as long as it addresses the particular needs of its specific markets and as long as its users and DEC remain loyal.

Users of 3090s exercise options

From page 35

ager of facilities engineering at Cigna Corp. in Windsor Locks, Conn. He said the MDS is more economical and more dependable than IBM's solution. He also said the MDS offers the advantage of being mounted under the floor adjacent to the computer, where he can shut down power for maintenance on the 3090 without affecting the power supply for other mainframes.

"IBM wanted us to have two separate feeders, which would have meant a lot of man-hours in terms of cabling. If I did what IBM requested, it would have been at least double the

price of the MDS," Asadourian said.

Asadourian reported that IBM field engineers were concerned about the power feeds that A. P. Systems proposed to provide until IBM, Cigna and A. P. Systems representatives held a meeting and agreed that the power supply was adequate.

Another 3090 user, Union Mutual Life Insurance Co. of Portland, Maine, was using a non-IBM motor generator power supply for the IBM 3081 mainframe that was replaced by a 3090 Model 200. Union Mutual electrical maintenance supervisor Arthur Osgood said the insurer already had a service contract with Clausen when Osgood realized from discussions with IBM engineers that he could split a single feed from the existing parallel bus, which allows any generator to feed any computer in the shop.

Osgood noted that there was no resistance from IBM when he proposed bringing in non-IBM products.

Clausen said he was not surprised by that, as many IBM field engineers are oriented toward the electronics of the computer itself more than the mechanical process of bringing power to the processor. He said that in his experience IBM field engineers have preferred that a third-party vendor take responsibility for providing power, as long as that power is adequate.

However, an IBM spokesman noted, "There are risks to using non-IBM solutions. One risk is that improper voltage and current levels could damage the technology and could present safety hazards. Another risk is that we couldn't guarantee that another power supply could meet IBM power specifications."

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MICROCOMPUTERS



SMALL TALK

Eric Bender
CW Senior Editor

Ups and downs of pricing issue

Despite all the changes in personal computing, there still are many issues that intelligent men and women can argue indefinitely — even in pricing, which should offer plenty of hard evidence.

Depending on who's talking, the cost of microcomputer business software seems to be either rising or falling or maybe staying about the same.

"There is no reason for software to be priced as high as most of it has been until now," columnist Erik Sandberg-Diment argued in *The New York Times* two weeks ago.

He made an intuitive argument: It just doesn't cost all that much to write, manufacture and distribute software.

IBM bolstered the opposing case in early November by raising prices on 139 Personal Computer packages as much as 10%. The move startled many — at least one trade publication ran the story under an "IBM cuts prices" headline — although it mostly bypassed mainstream applications.

Noting the tangled group of events that influence pricing, Software Access International, Inc. President William Cogshall presented figures last month showing wholesale costs of productivity software dipping in fourth-quarter 1984, rising through second-quarter 1985 and then dropping again.

Software Access projections show the average customer price for IBM Personal Computer productivity software declining slightly from \$292 this year to \$281 in 1986.

So what's the view from the most successful vendor of inexpensive business software, Software Publishing

See **UPS** page 50

Volkswriter 3 gets upgrade

Design incorporates calculator, spelling checker

By Eric Bender

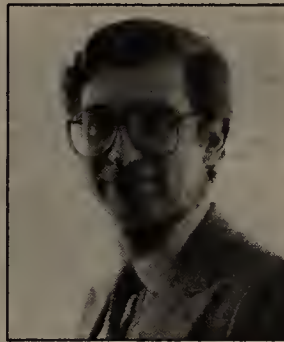
MONTEREY, Calif. — As Lifetree Software, Inc. founder Camilo Wilson described it, his design goal for the new Volkswriter 3 word processing program was to add appropriate related features — including mathematical functions and a spelling checker with a 170,000-word dictionary — without cluttering up the user interface.

The Volkswriter 3's four-function calculator will help users deal with expense accounts or budgets while staying within a document, he said. "We're not claiming it's a spreadsheet. It's for 'what is' math rather than the 'what-if' math of a spreadsheet," he said.

The spelling checker can suggest phonetically similar alternate spellings, correct transpositions and verify punctuation. Additionally, automatic hyphenation, sorting, global and automatic reformatting, print queuing and mail-

merging capabilities are provided.

Volkswriter 3 shipped in November with a \$295 price tag. Current Volkswriter users, who number about 150,000, can upgrade for \$95.



Lifetree Software's
Camilo Wilson

Responding to user requests, Lifetree also built in the ability to convert files to and from IBM's Revisable-Form-Text Document Content Architecture format, aiding the transmission of documents throughout Distributed Office Support System (Disoss) environments.

Disoss "seems to be a dominant trend" in linking systems within large corporate networks, Wilson commented. From a software supplier's

point of view, "all you have to do today to join the bandwagon is add revisable-text files," he said.

However, one limitation on the revisable-text format is the requirement for users to convert documents for local print-

See **UPGRADE** page 50

Products flourish, prices slide in nonimpact printer market

By Peggy Watt

LAS VEGAS — The parade of nonimpact printers was lengthened and its variety heightened late last month, with an array of systems introduced at Comdex/Fall '85.

The flurry included new entries in the driver engine design, with C. Itoh Electronics, Inc. and Delphax Systems, Inc. teaming up on a Delphax engine-based series and Dataproducts Corp. promoting a Toshiba Corp.-based system. Early laser printers were largely based on Canon U.S.A., Inc. systems.

As the nonimpact printer population increases, the prices decrease. Hewlett-Packard Co.'s Laserjet, introduced a year and a

half ago, is priced at \$2,995, and most of the newcomers view that as the price to beat.

Lower prices also make the quiet, high-volume nonimpact printers more attractive to medium-size and small offices, where they are usually hooked into a local-area network.

The crisp quality, capability of mixing text and graphics on a page and increased variety of type fonts represent other advantages for users interested in desktop publishing, from the internal company newsletter to typesetting and production companies.

More details on Comdex debuts are
See **PRINTER** page 46

INSIDE

Corona Data Systems renames itself Cordata and expands its IBM-compatible line/42

Corvus Systems' Omninet supports Apple's Macintosh and Novell's Netware/O software/42

NEW THIS WEEK

- Microsoft enhances its Macro Assembler
- Conetic Systems upgrades its Higgins software

■ For more on these and other new products, see pp. 87-122.

INSTANT ANALYSIS

"The smart people have already bought micros. Today's first-time users are not only inexperienced but they're dumb."

— William Cogshall,
Software Access International

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tion of DB2 and SQL/DS applications. The flexibility of the personal computing environment is made available to programmers creating applications for use with IBM's relational database products.

■ The ORACLE Personal Information Center extends the Information Center concept to the Personal Computer. ORACLE's application generator, graphics, spreadsheet and other end-user tools provide a SQL/DS and DB2 compatible Information Center on the desktop.

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ORACLE is currently installed on over 1000 supermini and mainframe systems around the world, as well as on thousands of PCs and compatibles. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and many government agencies.

For further information, contact Oracle Corp., Dept. C, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350.

MICROCOMPUTERS

Corona Data Systems to change name, redirect market focus

Unveils desktop, graphics card

By Clinton Wilder

LAS VEGAS — Corona Data Systems, Inc. announced at Comdex/Fall '85 that it will change its name to Cordata, Inc. as of Jan. 1. The Thousand Oaks, Calif.-

based firm said it hopes to change its image as an IBM Personal Computer clone manufacturer, but the name change reportedly stems from a proprietary dispute with SCM Corp.'s Smith Corona typewriter business.

Entering the add-on board market while also reinforcing its IBM-compatible systems product line, Corona un-

veiled a color graphics adapter card and a desktop micro compatible with the IBM Personal Computer AT.

The Corona ATD, shipping in the first quarter of 1986, reportedly runs the Intel Corp. 80286 chip at 8 MHz with zero-wait states and retails at \$3,995 in its base version, dubbed the ATD-8-Q.

Complementing Corona's

ATP series of portable micros, the ATD features 640K bytes of main memory, 1.2M bytes of floppy-disk storage, a floppy disk drive controller, parallel and serial ports, a socket for the Intel 80287 math coprocessor, four AT-compatible slots and two Personal Computer-compatible slots.

Two other expanded mem-

ory versions of the ATD are available. The ATD-8-Q20, featuring a 20M-byte hard disk drive and controller, is priced at \$5,495. The ATD-8-QT40, containing a 40M-byte hard disk drive, controller and 60M-byte streaming tape drive, sells for \$8,995.

Corona's Fastdraft 480 color graphics card is said to expand graphics capabilities of the IBM Personal Computer, Personal Computer XT, AT and compatibles. The card produces 640- by 480-pixel resolution in 16 colors.

The board will ship in January for \$1,295.

Corona also introduced a 14-in. color monitor, compatible with the Fastdraft 480. It adjusts to frequencies ranging from 15 to 35 KHz and costs \$895.



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Corvus opens its net to Mac

SAN JOSE, Calif. — Corvus Systems, Inc. has opened up its Omninet local-area network to support Apple Computer, Inc.'s Macintosh and Novell, Inc.'s Advanced Netware/O, an extensive library of file locking schemes.

Macintoshes now can co-exist with IBM Personal Computers on Omninet, according to the company.

Corvus' Macintosh Omninet Network Interface works with Corvus' disk network management system and enables Macintosh users to share Omnibus disk drives. The interface attaches to a Macintosh modem port through a short, flat ribbon cable.

The disk drives, available with 11M bytes to 126M bytes of storage, can be partitioned for public, private or shared files, according to Corvus. Packages with suitable import/export capabilities can be shared by IBM Personal Computer and Macintosh users, Corvus said.

Also, an Apple Laserwriter connected to the network can spool and print Macintosh files.

The network interface and net management software cost \$395 each.

Advanced Netware/O works with Corvus Trimline Combo, a 20M-byte hard disk and 60M-byte streaming tape add-on subsystem. Any device on the network can use the subsystem as a server unit, and the subsystem can also serve as a workstation on the network.

For \$5,795, a user will receive a Trimline Combo, four Omninet network cards and Advanced Netware/O for up to eight users.

— Paul Korzeniowski



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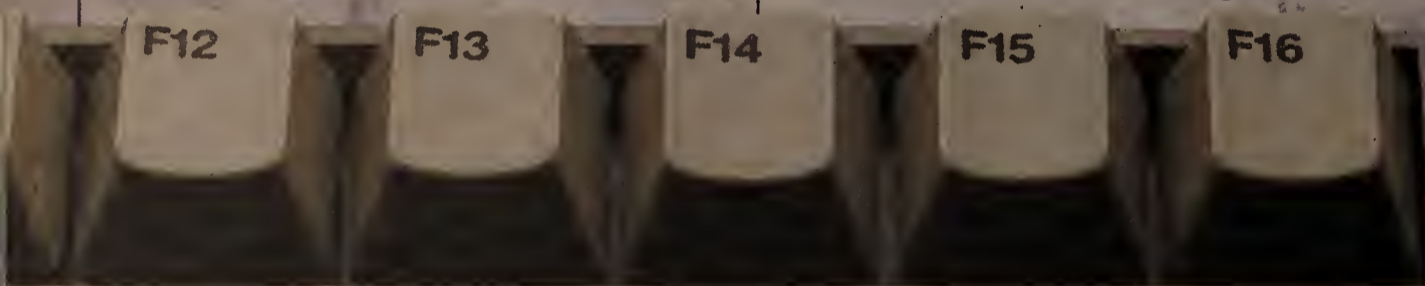
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MICROCOMPUTERS

Printer mart flourishes

From page 41

given below:

■ QMS, Inc. of Mobile, Ala., introduced the QMS KISS (or Keep It Smart and Solid), a \$1,995 laser printer that the company said will be available in limited quantities this month.

The Motorola, Inc. 68000-

based system runs on a Canon engine, prints 6 page/min, mixes text and graphics at 300 by 300 dot/sq in. and has a choice of nine fonts available through the 2-character control panel. The system also supports downloading of fonts.

The QMS KISS features 128K bytes of user-accessible memory and 256K bytes of internal memory. An IBM Personal Computer-compatible Centronics Data Computer Corp. parallel interface is

standard, and an RS-232C interface is optional.

■ C. Itoh Electronics of Los Angeles and Delphax Systems of Westwood, Mass., jointly introduced the CIE 3000 Ion Deposition Printer series, scheduled to be available in early 1986. Systems will be available in 30 and 45 page/min models and also with a choice of 240 by 240 or 300 by 300 dot/in. resolution, according to Ken Yanagisawa, C. Itoh marketing representative.

C. Itoh is touting the printer's reliability and said its drum life is one million copies.

Estimated price for the 30 page/min, 240 by 240 dot/in. model is \$12,000. The 30 page/min, 300 by 300 dot/in. system costs \$13,000, Yanagisawa said. Other prices have not been set.

■ Ricoh Corp. of West Caldwell, N.J., introduced its LP4080R tabletop laser printer, based on a Ricoh engine that has also been pro-

vided to Digital Equipment Corp. under an OEM agreement. It is scheduled to be released in the first months of 1986. No pricing was available.

The 8 page/min printer is rated at 5,000 prints per month, according to a Ricoh spokeswoman. Resolution is up to 300 by 300 dot/in., with four on-board fonts. The Ricoh printer emulates the Diablo Systems, Inc. 630 impact printer to accommodate numerous popular programs. It has both an RS-232 serial port and parallel port. Its paper feed cassette holds up to 250 sheets, and output is facedown.

■ New in the area of LED array imaging technology, an alternative nonimpact printing method, was a system from NEC Information Systems, Inc. in Boxboro, Mass. NEC entered the OEM page printer market with the LC-900, a \$2,995, 8 page/min desktop page printer with four resident type fonts, a 128K-byte memory buffer and optional 1.3M-byte memory board.

The printer is based on an NEC LED engine, compatible with the Canon laser engines introduced earlier, according to Ned Bunnell, NEC spokesman. It has an LCD operator panel and dual serial/parallel interface for systems integration. It handles 250 sheets in a cassette and offers face-down or faceup output. Another eight typefaces are available with additional font cartridges, as well as additional paper trays. The system prints bit-mapped graphics at 300 by 300 dot/in. with the optional memory board.

■ Another LED system came from Kentek Information Systems, Inc. of Allendale, N.J., which showed the K-2 Intelligent Page Printer. The LED array system prints 240 by 240 dot/in., is aimed at high-volume merged text and graphics printing and sells for \$7,995.

The Motorola 68000 microprocessor-based printer has a 5¼-in. floppy disk drive, enabling it to perform program control functions and containing up to 30 fonts. Available now, the device prints 12 page/min, with facedown output.

■ Dataproducts of Woodland Hills, Calif., introduced a low-end laser printer, the LZR-1230, running with a Toshiba engine that the company says is half again as fast as its Canon engine-powered competitors. The \$3,495 printer produces up to 12 page/min at a resolution of 300 by 300 dot/in. and emulates the Diablo 630, Epson America, Inc. FX80 and Hewlett-Packard Laserjet Plus.

"We have features you don't find on other [comparable] machines," said Ronald Iversen, Dataproducts vice-president for the Non-Impact Printer Division, pointing to See **PRINTER** page 50

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MICROCOMPUTERS

Printer mart flourishes

From page 46

the intelligent key pad that allows programming at the printer as well as the personal computer, and the seven resident fonts. The laser printer also accepts the IBM Personal Computer character graphics set.

Iversen said the LZR-1230

can handle stacks of 200 sheets of paper, instead of the usual 100, and release printed sheets either face-down for security or faceup. Volume shipment is scheduled for April.

■ Corona Data Systems, Inc. in Thousand Oaks, Calif. — which is renaming itself Cordata, Inc. — upgraded the software to its LP-300 printer. The system can now take font and resolution information directly from the disk, without manual input

at the printer. Sixteen fonts come with the unit, with another 24 available separately and more promised.

The laser Xerographic page printer produces 300 by 300 dot/in. at up to 8 page/min. Its graphics capability is approximately one-third page full resolution with 640K bytes of memory, and full-page graphics with reduced resolution for graphics from an IBM Personal Computer or compatible system. It costs \$4,495.

Upgrade for Volkswriter 3

From page 41

ing, "a tedious process," he said. The next step will be toward final-form-text format, which will avoid that requirement, once the proper support software is in place throughout the network.

Lifetree's largest and most sophisticated customers are

turning toward Disoss, with plans for first implementations in the next year or so, but Wilson called Disoss only an interim solution.

"Disoss requires a mainframe — a big mainframe — and this is a temporary state of affairs," he said. Wilson predicted that emerging IBM communications standards, including LU6.2 and Netbios, will provide a foundation to build much more flexible arrangements.

Another important trend in word processing software is toward mixed text and graphics. Wilson listed three main markets that will appreciate that feature: engineers and scientists — the target for Lifetree's Volkswriter Scientific package; a "fun" market for users playing with the technology; and desktop publishing.

While desktop publishing is "an obvious market, it's not nearly big enough for all the people chasing it," Wilson said. He suggested that vendors are concentrating on low-end offerings rather than high-quality output.

Overall, personal computer word processing software represents "a very strange segment of the market," he said. "It's remarkable to me that, to this day, word processing is still so fragmented."

Chances are slim that any single vendor will dominate sales, because users show so much loyalty to the packages they know, he said. "There are coexisting religions."

Ups, downs of pricing

From page 41

Corp., which markets to its resellers for an average of \$60 a box?

According to Software Publishing President Fred Gibbons, Borland International, Inc.'s spectacular growth has led many to overestimate the role of pricing, but for the most part, Borland's success was built on product rather than pricing.

He predicted that Borland's repositioning of the Reflex data base analysis package at \$99 will not boost sales dramatically and pointed to other areas, such as project management, where prices are on the rise.

But he also gave a counter-example of a promising low-end attack. "I thought Paperback Software was on to something with a cheap 1-2-3 clone," he said.

At last month's Businessland conference in Dallas, he asked an audience of MIS-types whether they would buy a \$100 clone from a credible company, and "the whole audience raised its hands," he reported.

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NEWS



CALENDAR

WEEK OF JANUARY 5

JANUARY 6-8, IRVINE, CALIF. — **Automated Business Technologies '86.** Contact: James Ramsey, Automated Business Technologies '86, Suite 386, 8532 Commonwealth Ave., Buena Park, Calif. 90621.

JANUARY 6-9, ANAHEIM, CALIF. — **ATE West '86.** Contact: Morgan-Grampian Expositions Group, 1050 Commonwealth Ave., Boston, Mass. 02215.

JANUARY 6-10, SAN FRANCISCO — **Writing Procedures, Policies**

and Documentation. Contact: Mary Ann Cluggish, Information Mapping, Inc., 275 Wyman St., Waltham, Mass. 02154. Also being held Jan. 27-31 in Orlando, Fla.; Feb. 3-7 in Dallas; and Feb. 10-14 in Washington, D.C.

JANUARY 7-8, BOSTON — **Writing Management Reports.** Contact: Mary Ann Cluggish, Information Mapping, Inc., 275 Wyman St., Waltham, Mass. 02154.

JANUARY 8-11, MILWAUKEE — **Mini and Microcomputer Concepts.** Contact: John T. Snedeker, University of Wisconsin at Milwaukee Extension, 929 N. Sixth St., Milwaukee, Wis. 53203.

JANUARY 9, DEDHAM, MASS. — **Elements and Applications of Microcomputers in the Graphic Arts Industry.** Contact: Frank R. Trocki, Director, Graphic Arts Program, Northeastern University Center for

Continuing Education, 370 Common St., Dedham, Mass. 02026. Also being held Jan. 16 and 30 and Feb. 6 in Dedham.

JANUARY 9, IRVINE, CALIF. — **Invitational Computer Conference.** Contact: Suzanne Hubner, U.S. Conference Director, Invitational Computer Conference, No. C-2, 3151 Airway Ave., Costa Mesa, Calif. 92626. Also being held Jan. 28 in Austin, Texas, and Jan. 30 in Dallas.

WEEK OF JANUARY 13

JANUARY 12-14, KEY BISCAYNE, FLA. — **The Outlook for Computer Printers.** Contact: Gail Montgomery, Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

JANUARY 13-15, ATLANTA —

Telecommunications Management. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JANUARY 13-15, WESTBORO, MASS. — **A Structured Approach to Software Testing.** Contact: Central New England College, 3 Westboro Business Park, Research Drive, Westboro, Mass. 01581.

JANUARY 13-17, MILWAUKEE — **Microprocessor Hardware and Software — An Introduction.** Contact: John T. Snedeker, University of Wisconsin at Milwaukee Extension, 929 N. Sixth St., Milwaukee, Wis. 53203.

JANUARY 14-16, KEY BISCAYNE, FLA. — **Thermal Printing.** Contact: Gail Montgomery, Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

JANUARY 14-16, LONG BEACH, CALIF. — **Annual Battery Conference '86.** Contact: Rita Johnson or Jane Doherty, Annual Battery Conference, Department of Electrical Engineering, California State University, 1250 Bellflower Blvd., Long Beach, Calif. 90840.

JANUARY 15-16, SAN JOSE, CALIF. — **BUSCON '86.** Contact: Anne Weber, Bus Users Show and Conference 1986, Suite 116, 17100 Norwalk Blvd., Cerritos, Calif. 90701.

JANUARY 15-17, DENVER — **Unix Technical Conference.** Contact: Unix Conference Office, P.O. Box 385, Sunset Beach, Calif. 90742.

JANUARY 16, NEW YORK — **CDLA Regional Reception.** Contact: Dianne L. Sims, Manager of Convention Planning, Computer Dealers and Lessors Association, Inc., 1212 Potomac St. N.W., Washington, D.C. 20007. Also being held Jan. 23 in Minneapolis.

JANUARY 16-18, SAN FRANCISCO — **Macworld Exposition.** Contact: World Expositions, Mitch Hall Associates, P.O. Box 860, Westwood, Mass. 02090.

WEEK OF JANUARY 19

JANUARY 19-22, DALLAS — **Forum '86.** Contact: Recognition Technologies Users Association, P.O. Box 2016, Manchester Center, Vt. 05255.

JANUARY 20-21, ARLINGTON, VA. — **Ada.** Contact: Specialized Training Services, Inc., P.O. Box 1618, Dahlgren, Va. 22448.

JANUARY 21-22, NEW YORK — **Introduction to Telecommunications Systems: Technologies and Applications.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JANUARY 21-23, SAN JOSE, CALIF. — **ASEE '86 — Advanced Semiconductor Equipment Exposition Technical Conference.** Contact: Joyce Estill, Exposition Manager, Cartledge & Associates, Inc., M259, 1101 S. Winchester Blvd., San Jose, Calif. 95128.

JANUARY 23-25, SAN DIEGO — **1986 SCS Multiconference.** Contact: Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

JANUARY 24-25, DEDHAM, MASS. — **Copyfitting.** Contact: Frank R. Trocki, Director, Graphic Arts Program, Northeastern University Center for Continuing Education, 370 Common St., Dedham, Mass. 02026.

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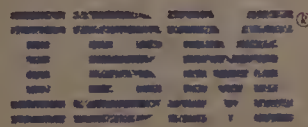
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COMPUTERWORLD

Update

December 9, 1985

Japan Inc. In the U.S. computer market



Update

The U.S. data center: Can Japan have an impact?

By Glenn Rifkin
Update Editor

Sometimes I think if Japan didn't exist, it would have to be invented. Then it occurs to me that Japan already has been invented.

— Jon Woronoff
Inside Japan Inc.

Hiroshi Kashiwagi is happy to clear up the misconceptions. As the director of the computer systems division of Japan's Electrotechnical Laboratory (ETL) in Tsukuba's Science City, Kashiwagi is a prime mover in the development of Japan's advanced computer systems. He is well aware of the variety of interpretations of Japan's Fifth Generation Computer Systems and Superspeed Computer projects theorized by journalists, academicians and others since the projects were launched several years ago. Can Japan, through its Institute for New Generation Computer Technology (ICOT) Project, leapfrog current technologies and dominate future computer markets?

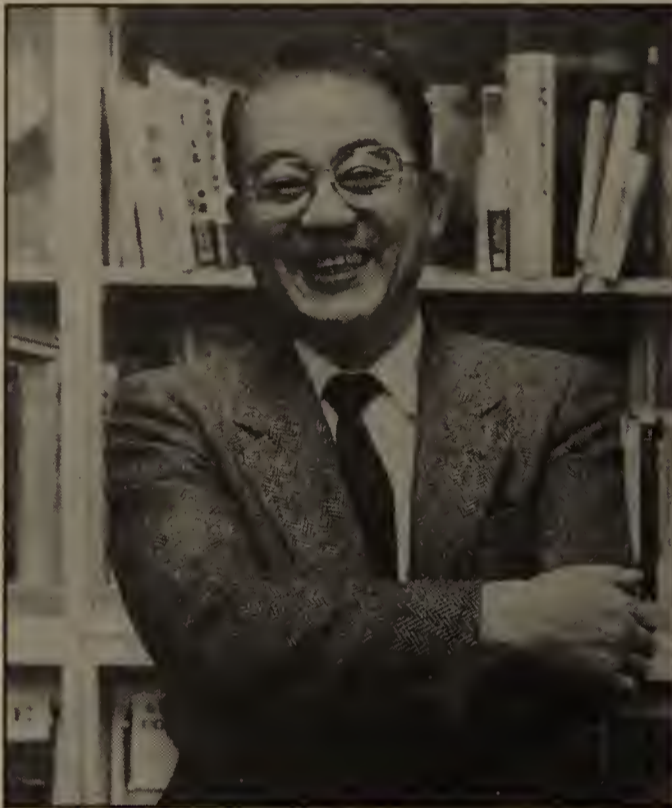
Kashiwagi laughs heartily. "There are three ways of understanding this," he says. "The first is to look at what would happen if we got all the funding and personnel that the researchers have requested, which is what the journalists like to write about.

"The second is the idea put across by Edward Feigenbaum [in his controversial book *The Fifth Generation*]. But what he writes about is a completely different project. What he says we are doing is actually what he's doing — making expert systems. What we're doing has nothing to do with expert systems.

"And third is what we are really doing."

What ETL is "really doing," according to Kashiwagi, is providing support to ICOT in four key areas: high-speed hardware, architectures, software development and enhanced algorithms. He says that despite the hype and hysteria set off by these futuristic plans, the truth is that Japanese researchers, like their American counterparts, are trying to push out the frontiers of computing by demonstrating possible directions. Timetables, in many instances, are meaningless, and the Japanese are certainly not expecting breakthrough technology to lead them into the 21st century of computing.

The beliefs and mysteries surrounding Japan in general and its computer industry specifically are varied and are often distortions of the truth. Kashiwagi's experience in trying to separate fact



The Electrotechnical Laboratory's Kashiwagi, director of computer systems

'Japanese vendors have found the computer systems market largely unapproachable, requiring links to U.S. companies for the necessary service and distribution capabilities. The competitive history to date has seen at least as many failures as successes.'

— IDC report

from fiction for Western businessmen and journalists is common in these times when the Japanese are both admired and despised and more often misunderstood.

Japan Inc., the vaunted collaboration between government, bureaucracy and industry, earns high praise, and the "learn from Japan" syndrome has spawned an army of Japan watchers in the U.S. At the same time, huge trade imbalances between the two countries create increased friction. The anti-Japanese backlash results in nationalistic posturing, legal action and Toyota burnings in Detroit.

Aside from semiconductors and peripherals, the Japanese have found the going tough in the U.S. computer market. Their production and manufacturing expertise that serves them so well in cars and videocassette recorders has not yet resulted in computer system sales.

According to a report from International Data Corp. (IDC), a Framingham, Mass.-based consulting firm, "Japanese vendors have found the computer systems market largely unapproachable, requiring links to U.S. companies for the necessary service and distribution capabilities. The competitive history to date has seen at least as many failures as successes. Despite inroads in printers and disk technology, Japanese vendors have found it difficult to penetrate end-user markets, and the overall dominance of U.S. vendors remains largely intact."

IDC estimates that Japanese vendors accounted for 13.8% (\$5.1 billion) of the value of U.S. computer and peripheral hardware sales in 1984 (see chart page 58).

Though the Japanese acknowledge that selling computer systems in the U.S. is a difficult task, they also realize that their own domestic markets are becoming saturated, and new horizons must be found. They point to Asian markets, particularly China, and developing nations as natural targets. But no major Japanese computer firm has given up on the U.S.

The DP/MIS manager in this country has shown only passing interest in Japanese activities in the data processing arena (see survey page 60). Generally disinterested in where the memory chips and laser printers are made, DP pros have not had much opportunity to interact with Japanese mainframe or mini-

vendors. Many are unaware of or unconcerned that machines they are buying from such vendors as Amdahl Corp., National Advanced Systems Corp. and Honeywell, Inc. may well be manufactured by these firms' Japanese partners.

The Japanese, howev-



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Update

er, are as committed to the information processing business as U.S. companies are. Though not currently a major factor in the systems business, the potential and talent are there. The Japanese are hard at work developing future technology through government-backed programs, such as ICOT's Fifth Generation project. Regardless of which country is truly closer to next-generation systems, nobody has made money selling the Japanese short. This section of *Computerworld* Update will focus on Japan's influence on the U.S. computer market, what has been accomplished thus far and what the future holds.

Large systems

In Japan, several key players share major parts of the market. Prior to 1979, IBM dominated the Japanese market and still would, many feel, if Japan's Ministry of International Trade and Industry (MITI) had not intervened.

After orchestrating cooperative agreements between the major Japanese firms, MITI pushed hard for the domestic companies to create plug-compatible machines that would win back market shares from IBM. That plan, along with some innovative technical, marketing and support maneuvers, helped Fujitsu Ltd. grab the lead.

Today, Fujitsu, NEC Corp., IBM Japan and Hitachi Ltd. share roughly equal portions of the large-systems market. This fact alone creates major differences between the Japanese and U.S. industries.

It means, for example, that the three major Japanese vendors must fight each other to retain domestic market shares, leaving diminished resources and inclination to make a significant thrust into U.S. territory.

"Setting up their own marketing and support networks in the U.S. requires enormous amounts of money, manpower and time," says Yuji Ogino, director of IDC Japan Ltd. "At this stage, that would be very impractical for Japanese data processing product vendors. They are still facing intense competition in the domestic market, and that market is at the point of saturation, especially in the large mainframe area."

In addition, IBM is clearly unhappy about losing its market share in Japan and is putting enormous pressure on the Japanese vendors, particularly in the area of software infringement. IBM currently is suing Fujitsu over copyright infringement, a case that is in arbitration. This pressure makes it more difficult for Japanese vendors to continue their IBM-compatible strategies. There is, however, little choice for them.

IBM President John F. Akers, speaking last month to security analysts in Greenock, Scotland, stressed the problems in following an IBM-compatible course. "First of all, the Japanese have a history of attention to detail, to manufacturing products at high quality and low cost, and no one can argue with that track record. And I would expect they are going to continue to be extraordinarily competitive in that regard," Akers said. "But they have no corner on innovation, and they have no corner on technological leadership."

"We believe, although we're not the technology leader in every single thing we try

to do, we are the leader technologically in our industry, including the Japanese. They will continue to try to emulate IBM. Many of them, of course, are on a compatible strategy with IBM systems. And in that regard, they will continue to have a problem because they have not had the success in software that they've had in their manufacturing."

Late last year, IBM sent 250 of its U.S. staff members to its Asia/Pacific Group headquarters in Tokyo to beef up an operation that plainly wasn't pleasing the main office. Though the added manpower will devote its attention to other Asian markets, such as China, IBM clearly is aiming to regain its No. 1 spot in Japan.

For Fujitsu, Hitachi and NEC, the choices are growing smaller. As Ogino puts it, the companies are now "playing the game within IBM's ballpark, and the main issue for them is how to get out of that ballpark and play their own games."

While the major competitors grapple in Japan, the U.S. systems market has a much bluer cast to it, leaving little room for foreign colors. According to IDC, sales of Japanese manufactured CPUs make up just 2.8% (\$1.1 billion) of the overall U.S. computer systems market. U.S. strengths in software and computer architecture make the CPU business difficult for the Japanese.

In addition, a DP/MIS manager opting for a Japanese mainframe is taking a risk, according to Jack Hart of IDC. In order to take that risk, there must be something in return. "For the MIS manager to stick his neck out, he'll need to get a big price/performance benefit from Hitachi or Fujitsu," Hart says. "A 5% difference is not enough."

Nonetheless, the Japanese recognize the potential of this market and find the best way in the door is through joint agreements with U.S. partners (see chart page 66).

Three such successful ventures include the following:

Fujitsu and Amdahl — Fujitsu owns 49% of Amdahl and has maintained a relationship with

the company since the early 1970s. Amdahl sells IBM-compatible large-scale systems that are based on Fujitsu subassemblies. Though Amdahl customers realize Fujitsu's role in the company, most DP/MIS professionals pay little attention to it. Fujitsu itself is strongly committed to the partnership.

"We will continue to see a close relationship with Amdahl in the future," says Toshio Hiraguri, board director and general manager of Fujitsu's Computer Systems Group. According to Hiraguri, before the end of the year, Fujitsu will be announcing a machine comparable to or faster than IBM's 3090 that will be available through Amdahl in the U.S. Amdahl also markets Fujitsu's supercomputers.

Hiraguri points out that while Fujitsu makes use of Amdahl's capabilities in creating high-quality IBM-compatible systems, the Japanese company offers Amdahl more than just strong manufacturing and production expertise. He says that Fujitsu, which is strong in an IBM weak spot — communications — plans to offer communications control processors in the U.S. through Amdahl.

Though the Fujitsu-Amdahl connection makes large mainframes, the biggest Japanese influence in the U.S. market (more than 60% of Japanese sales are in large systems), Ogino points out that the value of Fujitsu's shipments to Amdahl has declined in the past few years.

Hitachi and National Advanced Systems — This marriage was made in 1979 when National Semiconductor Corp. acquired Intel Corp., a plug-compatible manufacturer (PCM) and renamed it National Advanced Systems (NAS). Intel had developed an import arrangement with Hitachi, so as a result of the acquisition, National Semiconductor inherited that connection.

Through NAS, Hitachi markets large and medium-size systems in the U.S. Amdahl and NAS remain the only PCMs in the U.S. market, and industry watchers say they

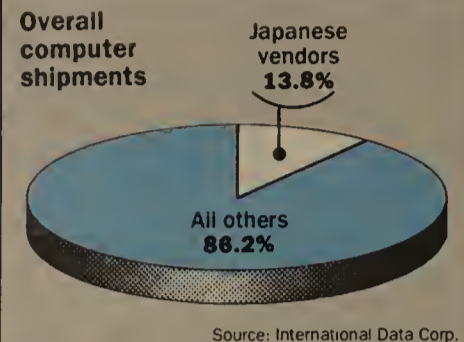
feel that both Fujitsu and Hitachi will concentrate more effort on establishing OEM agreements to sell storage devices than on pushing PCMs. Together, Amdahl and NAS hold approximately 10% of the large-systems market.

The Hitachi/National Semiconductor relationship is an ironic one in that National Semi has joined other semiconductor manufacturers in legal action against Japanese firms like Hitachi for allegedly dumping memory chips on the depressed U.S. market.

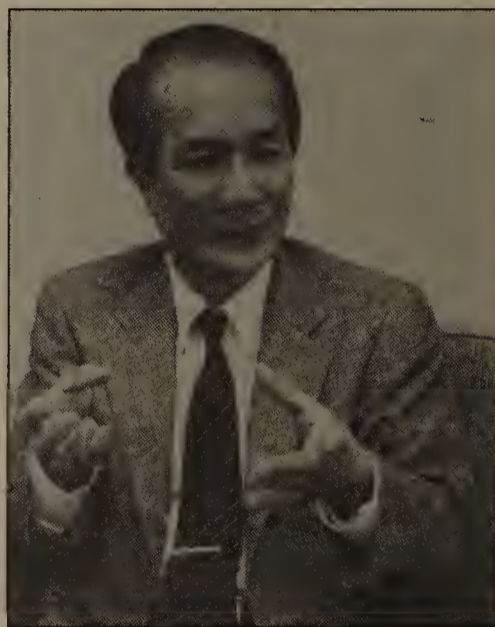
Nonetheless, Kazutaka Tsukamoto, computer group engineering division manager at Hitachi, says he feels that the relationship with NAS is secure. He acknowledges that sales of mainframe equipment are likely to decline in the next few years, and though Hitachi will continue to try to penetrate the mainframe market, "Our efforts will be greater in the area of smaller equipment rather than mainframes."

Tsukamoto says that despite the many hurdles, Japanese computer makers are doing "pretty well in the U.S. market. In distributing mainframe hardware, it's very important to take into consideration

JAPAN'S 1984 U.S. MARKET SHARE



MITCHELL HAYES



Hiraguri says Fujitsu is strong where IBM is not — communications.

TOP 10 COMPUTER MANUFACTURERS' FINANCIAL RESULTS IN JAPAN¹

Manufacturer	Fiscal Year '84 Total Company Sales	Fiscal Year '84 Information Systems Total Sales	1983-84 Growth ²	Fiscal Year '84 Information Systems Domestic Sales	Fiscal Year '84 Information Systems Export Sales	Projected Fiscal Year '85 Information Systems Total Sales
Fujitsu Ltd.	1,291,734	857,349	29.6	687,349	170,000	1,014,000
IBM Japan	768,760	768,760	25.6	545,539	223,220	N.A. ³
NEC Corp.	1,889,340	662,000	27.3	569,100	92,900	790,000
Hitachi Ltd.	3,025,754	532,000	20.1	428,260	103,740	600,000
Toshiba Corp.	2,525,953	231,500	26.5	192,400	39,100	293,000
Ok Electric Industry Co.	361,866	185,000	12.3	127,650	57,350	203,000
Mitsubishi Corp.	1,858,268	165,000	26.9	132,000	33,000	216,000
Nippon Univac	121,546	121,546	13.0	121,546	0	135,000
Burroughs Corp.	80,700	80,700	20.9	71,000	9,700	N.A.
NCR Japan	89,882	69,601	13.6	66,408	3,193	N.A.

¹ In millions of yen. One yen is approximately equal to 0.0045 cents.

² In percent.

³ Not applicable.

Source: International Data Corp.

Continued on page 66

Update

Koji Kobayashi, the 78-year-old chairman and chief executive officer of Japan's NEC Corp., has earned acclaim as a dynamic international businessman and leader. The diminutive and jovial Kobayashi joined NEC in 1929 and has had a strong hand in steering the company's course since 1949, when he was elected company director. He was named president in 1964 and chairman in 1976.

Kobayashi built NEC into one of the world's largest communications companies and Japan's second largest computer company with \$9 billion in revenue, 90,000 employees in 11 countries and a product portfolio of more than 15,000 items.

Since 1977, Kobayashi has doggedly pushed NEC toward his "C&C" plan. He is convinced that the future holds the inevitable link-up between computers and communications and has directed NEC's strengths in both fields toward this integration.

On a recent visit to Boston to celebrate the publication of his sixth book, *Computer and Communications: A Vision of C&C*, (The MIT Press, 1985), Kobayashi met with Computerworld Update Editor Glenn Rifkin to discuss Japan's role in the U.S. computer market.

Is there such a thing as Japan Inc.?

Where is Japan Inc.? In every country, the bureaucracy is trying to catch the industry. The industry wishes to be released from the bureaucracy. It's impossible to work with the bureaucracy. I believe there is no such thing as Japan Inc.

Why do many people have the perception that Japan Inc. exists? Is it a creation of Western journalists?

When we are talking with your country, we are talking not with Washington, D.C., but with industry. We have a long relationship with U.S. industry in every respect. This is not Japan Inc., it's NEC, Inc.

So I don't know the real meaning of Japan Inc. When you say Japan Inc., there should be some rigid framework for the connection of the Japanese government and industry, and there isn't. Japan Inc. is fiction. For instance, if U.S. industry has some concern with the government, it goes to Washington, D.C. But we don't call it U.S. Inc.

Can you compete with IBM in the U.S.?

Impossible — depending upon the meaning of "competition." When we say "competition," we mean capital-wise, technology-wise, everything. Capital-wise, IBM is gigantic. Japanese companies are very small. It's silly to try to compete with IBM with their huge amounts of money. IBM has established a complete monopoly all over the world. We are only trying to protect ourselves from such a gigantic monopoly company.

In this market, we have no such ambition to fight with IBM. But there are many areas that IBM is not in, and we are coming into these markets.

For example, what markets?



The world according to Kobayashi

NEC's chairman talks about computers, communications and competition

It's nonsense to develop computers only. It's nonsense to develop communications only. Ultimately, computers and communications will be integrated. I announced that in 1977. Now that day is coming.

Fingerprint detection systems. [Kobayashi laughs]. They don't have that. So NEC might be the leader in this field.

A small computer like the NEC 9800 personal computer; we have a good market here for that. But in general in this computer market, we have no intention of competing with IBM. It's like throwing our heads against a concrete wall.

But you sell your \$1000 mainframe through Honeywell, Inc. in the U.S.

We were asked by Honeywell to supply that computer to them because they had no such big computer. We wondered whether we should supply this computer to the U.S. customer directly or not, and it was a very difficult decision. But we continue to have a very good relationship with Honeywell. We ultimately decided it would be better to supply it through Honeywell.

So there is no plan to sell it under the NEC name in this country?

No. Under the contract with Honeywell, if we are asked specifically from the customer, we can supply it.

Would you rather have an established base for large systems yourself in the U.S.?

I don't think so. To have such a customer base in this country requires a very big investment. From the business standpoint, if you have such a relationship as we have with Honeywell — almost 25 years — then it's better for us. We have NEC Information Systems, Inc. here for small and medium-size computers.

We are selling those by ourselves. I don't hurry that. The results are very good, and we are creating a customer base for ourselves.

Is it a matter of pride that with large systems you can't sell under your own name here?

Ultimately, that will come. But it's nonsense to develop computers only. It's nonsense to develop communications only. Ultimately, computers and communications will be integrated. I announced that in 1977. Now that day is coming. With AT&T divested and IBM released from the antitrust suit, they are both facing that question.

I've been thinking about this for 20 years. We are the first C&C [computers and communications] company. We will really establish our C&C business in this country ultimately.

It takes time. I'm not hurrying.

Is that how the Japanese companies will have the most effect — through this integration?

I don't know about the other Japanese companies.

I'm asking you to be a spokesman for Japanese industry.

That's difficult. I can't speak for the policy of each company. Therefore, it's possible the other Japanese companies would be against the idea of C&C. I don't know. They are not expressing their ideas to me. I can say that the other Japanese companies followed IBM compatibility. I'm not for such ideas.

Why did you decide not to go IBM

compatible?

Because I was thinking from the beginning of C&C. It's the only way to survive for the next world. I'm thinking of the 21st century.

What do you mean by C&C?

C&C is very simple. Communications cannot be done without the computer, and computing must have communications. They work together. The computer is heading toward distributed processing.

Communications is not limited to nations but is becoming worldwide. Communications will have several levels. One is public communications. Second is business communications. And third comes a new market, the home market.

It's multilayered. I'm talking about the start of the next century. It's already started.

What about IBM coming together with Nippon Telegraph and Telephone Corp. (NTT)? What does it mean for NEC?

That will be quite an event. But why did Japan release NTT from being a government operation? It was to protect from a monopoly. Monopoly is not good. If IBM or NTT wishes to have a monopoly over the market by this combination, it's against the law, and ultimately there will be a political reaction. The most important thing is that if one gets arrogant — "I can control the world" — that's not good. This is why we have antitrust laws.

So you think IBM is being arrogant?

I don't know. You said that. But when NTT and IBM get together, what happens? If that combination gets to be arrogant, it's a monopoly. The people will be completely against that idea.

My philosophy is that a business is not only for making money. A company needs to make money, but that company is allowed to exist because it is good for the people. We need to think of that. If the big companies become too selfish, then the company will ultimately decline.

You always need the competitive power, otherwise you cannot control it. Therefore, I believe privately that if a share is over 50%, it's against the morality of business. That's my feeling. For instance, in satellite communications, we had over 70% of the world market. So I told my people that it was too much. We should be satisfied with up to 50%. So now we have 35%.

If you were head of a U.S. computer company, what would your view be of the Japanese computer industry?

If you are concerned with only computers, Japan is not a menace. C&C is an unknown field. The market and technology are still to come. That's what we are aiming at. That's where there is a possibility. We are trying to be strong enough in C&C. If I were the president of a U.S. computer company, it would be hopeless because of the existence of IBM. If I were the president of a computer company in this country, a long time ago I would have headed toward C&C. Otherwise, it is hopeless. ■

Update

CW survey: Japanese not a force in U.S. data centers

By Joanne Kelleher
Special to CW

"Fifteen years ago, the owner of a Japanese car was probably quite a pioneer," says Nick Vittore, director of corporate data processing at De Soto, Inc. in Des Plaines, Ill., as he mulls over the prospects for Japanese computer products in the U.S. market. "Back then, buying a Japanese car meant driving many miles for service and putting up with the inconvenience of trying to find appropriate parts."

Looking at what the Japanese have since accomplished in the U.S. automotive market and observing similarly impressive performance records in consumer electronics, Vittore and other DP/MIS executives cannot discount the possibility that Japanese computer products might also become factors with which they will have to reckon. Still, from where these people sit, that day seems a long way off.

In a recent random *Computerworld* survey, 15 DP/MIS executives from around the country were asked about the potential of Japanese computer vendors in the U.S. market. By no means conclusive, the sampling did indicate that there was minimal Japanese presence in the systems arena and that it will be a long, hard climb for those vendors to become a force in the U.S. data center.

There is a general awareness that Japanese components are proliferating under the hoods of U.S. processing units. "I'm sure that if we looked inside our boxes we'd find a lot of Japanese components," says Michael Carberry, director of information and management services at Orion Pictures, Inc. in New York. Acquaintance with products of totally Japanese origin, however, is minimal, limited to a few scattered printers, microcomputers and some telecommunications equipment.

Knowledge about joint venture activity between Japanese and U.S. vendors is sparse, even among customers of the U.S. companies participating in the ventures. Vittore, for instance, although a Honeywell, Inc. user, knows no more about that company's association with NEC Corp. than what he has read in the press. "I've yet to hear about it from anyone who calls on us," he says. "Maybe that's because the system we are using, a DPS 7 Model 65, is much smaller than the one involved in the joint venture." Presumably the same rationale would apply at Sigman Meat Co., in Arvada, Colo., and Zeigler, Inc. in Minneapolis, two other Honeywell installations where the DP/MIS executives have heard nothing about a joint venture with a Japanese vendor.

A few DP/MIS executives report queries from National Advanced Systems Corp. (NAS) regarding a mainframe system offered in collaboration with Hitachi Ltd. These approaches, however, struck their recipients as curiously unaggressive.

"We were approached by NAS about a large-scale computer they are marketing for the Japanese," says Joseph Freudenberger, director of information resources for Sea-Land Corp. in Elizabeth, N.J., a worldwide freight shipping company. "My impression, however, was that it wasn't a very serious effort." Freudenberger also points to several business acquaintances, execu-

tives from companies with far weaker vendor commitments, who have told him that they also regarded the sales approaches they received from NAS as halfhearted.

Meanwhile, Richard Giordano Sr., director of MIS at the Titleflex Division of Bundy Corp. in Springfield, Mass., who considers himself a "pretty open-minded" prospect, expresses some surprise at the absence of information about Japanese products. "I haven't been approached," he says. "Most of the literature I read has little or no advertising for Japanese products." And, in the computer-assisted design and manufacturing area, where his company is on the brink of a purchase and where Giordano says he would expect that the Japanese might be quite advanced, Japanese products are notably absent at both trade show booths and in conversation. "I haven't even heard anyone talking about the Japanese yet," he says.

It will take much more effort and presence than DP/MIS managers are now sensing for Japanese computer vendors to make inroads at almost any level, the survey indicated. Pioneering is not an activity that most businesses are interested in, they say, and dependable access to parts and service is a nonnegotiable precondition of any computer purchase.

"If I have to make a decision on hardware, it isn't going to be based on where the equipment is manufactured," says Vittore. "But serviceability takes precedence even over price and performance, and I just don't think I'd have the confidence yet that the necessary service organization would be there for Japanese products."

Similar concerns recently led the Kellogg Co. of Battle Creek, Mich., to eliminate NEC from consid-

make establishing a foothold in the U.S. an arduous task for the Japanese.

For one thing, Japanese computer vendors won't be able to capitalize on quality deficiencies in existing products as their fellow countrymen did in the automotive industry, says Derek Mumford, director of worldwide systems development for Eaton Corp. of Cleveland. "The computer marketplace here has always demanded quality — and received it," he says. "The reliability of American hardware and software is much better than it has been for other products, like autos. So, a reputation for quality won't carry the Japanese very far in the computer area. In order to sell, they'll have to produce better features and functions for the dollar."

By most accounts, the differential would also have to be significant in order to lure U.S. buyers away from established U.S. brands. "A 10% difference in speed and price isn't worth switching from IBM for," Brazas says. "If they came in with a computer that was 100 times as fast as our current equipment and cost only half as much, then I might look at it."

It has by now become a truism that the Japanese can produce good quality at lower prices. While that is certainly not a bad reputation to have, it also means that what was once a market advantage may have turned into an entry requirement.

If Japanese vendors can meet such price expectations and still deliver equipment of equivalent or greater functionality than U.S. products, they may find some ready purchasers for microcomputers, terminals and peripherals.

Freudenberger believes that the microcomputer offers the easiest entry for Japanese vendors. "If they came up with something fast enough and cheap enough, they could probably get in there," he says.

It might be somewhat difficult for Japanese vendors to adjust to the necessity of interfacing with the wide variety of products found in a typical U.S. organization, observes Don Madden, manager of computer systems/planning at General Electric Co. in Bridgeport, Conn. "It would be difficult for any vendor," he says, "but probably more so for the Japanese, who are used to a different kind of relationship with their customers. In that country a vendor can be much more influential in the planning process and doesn't, typically, have to worry about a large number of already-installed systems."

Mumford's opinion is that the Japanese are making a strategic error by concentrating their initial market efforts on large-scale systems. "The problem is that

they started in the wrong place," he says. "They should have come in aggressively with small or mid-size systems in 1980 or 1981, when IBM's System/38 was going through its problems and a lot of traditional IBM users were approachable." The Japanese missed a great opportunity by not taking advantage of that situation, according to Mumford, but the market remains viable.

It's also not beyond the realm of possibility, according to Freudenberger, that the Japanese could leapfrog over even IBM if they were able to bring about the convergence of voice and data technologies. "The future belongs to whoever can solve the problem of integrating all systems facets," he says. "Whoever does it will run away with the ball game."

WHERE WAS IT REALLY MADE?

Japanese Supplier	U.S. Reseller	Products
ALPS Electric Co.	Apple Computer, Inc. Commodore Business Machines, Inc.	Floppy diskettes, personal computer Floppy diskettes
Canon, Inc.	Hewlett-Packard Co. Apple IBM Tandy Corp.	Printer Printer Printer Printer
Casio Computer Co.	Tandy	Pocket computer
Epson Corp.	IBM HP	Printer Printer
Fujitsu Ltd.	TRW Corp. Amdahl Corp.	Mainframe, small computer Mainframe
General Corp.	Texas Instruments, Inc.	Portable computer
Hitachi Ltd.	National Advanced Systems Corp.	Mainframe
Kyocera Corp.	NEC Information Systems, Inc. Tandy	Hand-held computer Hand-held computer
Matsushita Electric Industrial Co.	IBM	Multiterminal system
Mitsubishi Corp.	Sperry Corp.	Personal computer
NEC Corp.	Honeywell, Inc.	Mainframe
Nissei Sangyo	IBM	Cellular data terminal
Sharp Corp.	Tandy	Pocket computer
Sony Corp.	Apple HP	Floppy disk drive Floppy disk drive

Source: Dataquest Japan

eration as a supplier of telephone switching equipment. "They would probably have been among the top three or four contenders," says Gordon Brazas, director of information systems technology, "except that one of our criteria was that there be a half-dozen installations we could visit, and at the time NEC didn't have one switch up and operating in the U.S."

"We don't care to be out there experimenting," Brazas explains. "We want something proven, and we want to know that the vendor is going to be around when the equipment breaks down three years from now."

This insistence on well-established service capabilities is only one of several characteristics of the business systems market that are likely to

The time has come
for straight talk about
database management systems.

"The only reason to buy a database management system is to build better applications."

Throughout the history of the software industry, proponents of one database architecture after another have promoted their respective systems as the sole solution to a company's application backlog problem.

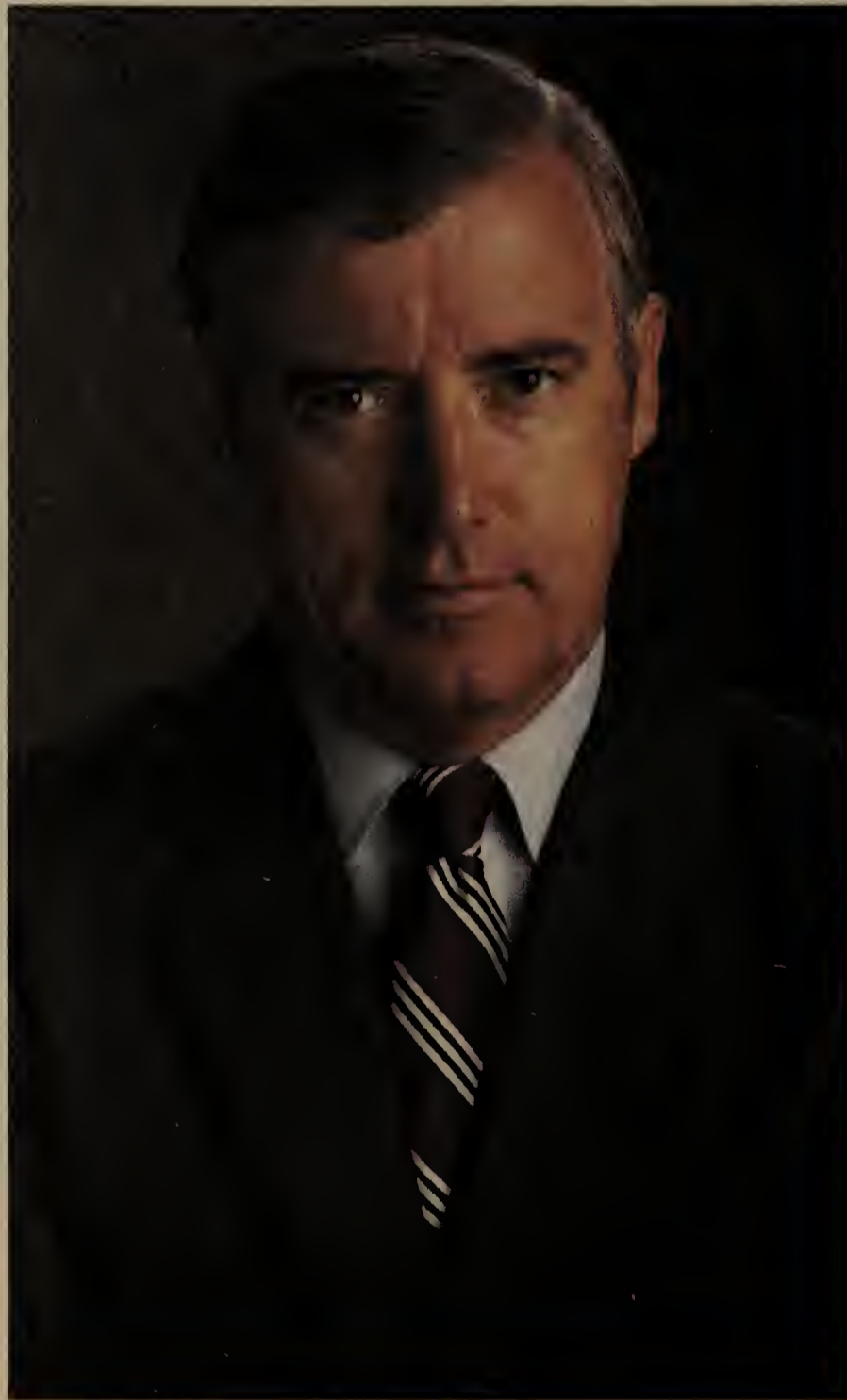
The early debate centered on hierarchical versus network architecture. Advocates of inverted file entered the argument in the 70's. And today, relational is the architecture of choice.

While this discussion about architecture is interesting, it's just not the issue.

Database management systems, beginning with the very first, were created to do one thing and one thing only—they were created to build better applications. *Building applications—efficient, online applications, faster, with fewer people—is the only real issue.*

Today corporations have a huge backlog to contend with. And the applications they need to develop have different characteristics. Some may be retrieval only. Some may be heavy on update. Some will run the company, and will require professional development. Some can be created by end users to satisfy their own needs.

It is extremely important to have a database



management system that can handle all applications. *It is essential* that a database include tools rich and comprehensive enough to accommodate both the professional developer and the end user. It's the richness and power of these tools that's critical to the successful implementation of highly responsive fourth generation applications. What's demanded, in fact, is software that goes a *step beyond* today's conventional relational database systems.

With a comprehensive database management system and the appropriate tools like the kind I'm talking about, you'll make the data processing department a *strategic asset* instead of corporate overhead. You will make your company succeed in a highly competitive world.

In Cullinet's new Annual Report, Presidents and CEO's of major corporations speak about the positive impact Cullinet has had on their operations. For a copy that you might like to read and pass along to your company president, write to me. I'll see that you get one.

A handwritten signature in dark ink, reading "J. Cullinane".

John J. Cullinane
Chairman of the Board

The only database management system worth buying is one that meets these six requirements.

Stated simply, IDMS/R is a step beyond today's conventional relational DBMS because it meets these key requirements for building successful applications.

1. **MIS Application Development Facilities**

The application development system required to build high performance production applications requires more than a fourth generation language. Cullinet's ADS/OnLine is a comprehensive application development environment for the MIS professional combining fourth generation language with a menu-driven modular development approach. Integrated with the data dictionary, this minimizes not just the programming but the entire design, development and documentation of an application. Furthermore, this approach produces a dramatic reduction in maintenance and support.

2. **End-User Application Development Facilities**

Because Cullinet recognizes the difference between production and end-user applications, as well as the need for both to share common data, we provide an easy to use end-user oriented development and inquiry system. The Automatic System Facility of IDMS/R is a non-procedural, menu-driven tool designed for end-users. Once data tables are defined, an application is automatically generated. The query facility of IDMS/R provides menu-driven query capability and full online help, so end-users can build working applications in minutes and get reports easily and efficiently.

3. **Relational Architecture**

IDMS/R allows for the definition of databases using the relational data model. Data tables and associated user views are easily defined online. Additionally, any number of key fields may be defined. IDMS/R also supports advanced relational features including referential integrity and domain

definition. This architecture provides the capability to address all application requirements.

4. **High Performance Database and Application Tuning Facilities**

IDMS/R is a full multi-tasking, multi-threaded system providing for concurrent processing of on-line and batch, update and retrieval applications. Additionally, tuning facilities provide efficient indexing techniques, space management, page management, and buffer management. No conventional relational DBMS has these capabilities.

5. **Dictionary Driven DBMS**

Data integrity and data independence are essential in a DBMS environment. The dictionary actively controls the source and use of all data. Data definitions, data validation criteria, data formats and security are all defined within the dictionary and exist only once, eliminating redundancy and ensuring integrity. This information is then automatically used throughout the system. Examples of the functionality of this facility include never needing to define output formats for query; never needing to define field attributes for screens; never needing to code validation and editing criteria when using ADS/OnLine. Only IDMS/R provides this level of dictionary integration.

6. **Open System Architecture**

With the unique Open System Architecture of IDMS/R you can maximize your investment in existing software. IDMS/R accepts data from outside the database environment with direct access to VSAM files. In addition, applications written to access other databases like IMS, DL/1, TOTAL, or VSAM can directly access IDMS/R without modification. IDMS/R is designed to work in virtually all IBM mainframe operating systems and teleprocessing monitor environments.

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Update

'Made in Japan' tag penetrating components market

U.S.-Japan pacts create added equipment sales

By Teresa A. Mortola
Special to CW

The Japanese participate in the U.S. computer market in a manner not reflected by the name on the box. A look inside almost any machine reveals a list of components "Made in Japan." This parts market is where the Japanese have most effectively penetrated the U.S. computer industry. The Japanese impact has also surely been felt in the large mainframe and supercomputer areas where the Japanese are selling equipment via agreements with U.S. vendors.

The printer market is undoubtedly the area in which the Japanese have been most successful in the U.S. In 1984, of the four million printers shipped in the U.S., well over half were sold by Japanese firms. And of all printers installed, 34% were Japanese products, with 1.8 million sporting the Epson Corp. brand name.

Certain areas, most notably nonimpact page printers, have been very fruitful for the Japanese vendors. With laser technology, Japanese vendors have accumulated more than a 70% share of the U.S. market shipments in 1984, with Canon, Inc. and its LBP-CX engine almost solely responsible for this success. Its laser engine has been sold through OEMs including Hewlett-Packard Co. for its Laserjet and Apple Computer, Inc. for its Laserwriter.

Japanese vendors sold nearly 2.2 million serial impact printers in the U.S. last year and were responsible for more than half of the 3.7 million total shipments.

The serial nonimpact area has also been a strength for the Japanese, who hold more than half of the U.S. market. Thermal, thermal transfer, and ink jet are the primary technologies in this group, with the largest growth segments being thermal transfer and ink jet. The Japanese vendors will continue to fare well since these two segments are strengths for them.

In the storage market, Japan has achieved

enviable success. In 1984, nearly one-third of all disk drives shipped in the U.S. were products of the Japanese. These vendors are particularly strong in the flexible drive area where they sold close to 40% of last year's U.S. shipments. The lower end of the flexible market — the 3½- and 5¼-in. drives — is where inroads have really been made. More than 95% of all 3½-in. flexible drives were shipped by Japanese vendors, while 38% of the 5¼-in. market belongs to them.

The Japanese control nearly one quarter of 8-in. and 9-in. fixed-drive markets with Fujitsu Ltd. far and away the leader, being responsible for nearly two-thirds of the Japanese shipments. Fujitsu also leads other Japanese vendors in the 10½- and 14-in. 200M-byte to 499M-byte areas with its 10½-in. product.

Fujitsu. Fujitsu is Japan's No. 1 computer manufacturer, producing everything from one-chip microcomputers to extremely large systems. In the U.S., Fujitsu America, Inc. has begun to make inroads with sales in 1984 approaching \$500 million.

In the computer markets, Fujitsu has enjoyed some success with its Micro 16 products, although the sales have not been phenomenally high. Its incompatibility with the IBM Personal Computer ensures it of limited potential. Fujitsu has gained a share of the high end of the computer market through its dealings with Amdahl Corp., of which it owns 49%.

The storage market has been a successful, growing area for Fujitsu. With products in virtually every segment of this market, Fujitsu leads Japanese competition in nearly every category.

Several products have been announced this year, including a streaming start/stop tape drive, a ½-in. cartridge tape and an intelligent disk controller. Just announced in November was Fujitsu's entry into the flexible disk drive area with both 3½- and 5¼-in. offerings.

Fujitsu is focused on the U.S. market and has built manufacturing facilities in Florida, Texas and Oregon. It hopes someday to manufacture

nearly all of its disk drives domestically.

Hitachi Ltd. Hitachi has a low profile in the nonsemiconductor markets in the U.S. This is changing as Hitachi has moved from the position of supplying only one company, National Advanced Systems Corp. (NAS), to becoming an OEM for many. It is reportedly opening another U.S. division to act as an OEM supplier and service and support center.

Hitachi has done very well in the U.S. market, reporting sales of \$1.1 billion for the latest year. Much of this, however, is semiconductor related.

The products offered in the storage area include Winchester drives in the 3½- (newly introduced), 5¼-, 8- and 8.8-in. areas. Additionally, flexible drive products of 5¼- and 8-in. are offered.

Through NAS, Hitachi offers large IBM plug-compatible machines as well as large disk drives.

Hitachi, considered by many as a national company in Japan, retains a Japanese business style in the U.S. that is reflected in a very slow, methodical mindset. Many members of the U.S. management team are Japanese nationals, different from the majority of Japanese vendors who employ a high percentage of U.S. managers. This may be a detrimental factor for Hitachi as it becomes more involved in the open market and realizes that a quick, reactive type of style prevails.

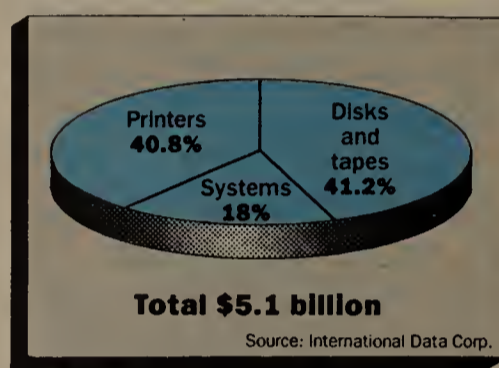
NEC Corp. NEC started in Japan as a manufacturer of telephone sets and switchboards, and it continues to be strong in the telecommunications area.

NEC Information Systems, Inc. was established in 1977 as a subsidiary of NEC and is headquartered in Buxboro, Mass. Sales for last year were approximately \$300 million.

The product line of NEC Information Systems includes personal computers, small business minicomputers, printers and disk drives. NEC has experienced moderate success with the personal computer line but has done better with its

Continued on page 70

JAPAN'S HARDWARE SHIPMENTS TO U.S.



MITCHELL J. HAYES

Honeywell, NEC team up

Within the past few years, it became increasingly clear to Honeywell, Inc. that its best strategy for survival in an IBM-colored world was to concentrate on medium-size to large systems, such as minicomputers and superminicomputers. Since it was losing market share, the firm simply did not have the resources to develop very large mainframes. The decision was made not to spend research and development revenue on top-of-the-line systems.

But Honeywell didn't want to risk losing even more existing customers to IBM. Honeywell decided it had to compete across the board, and two years ago, it turned to its Japanese partner of more than 20 years, NEC Corp.

NEC, Japan's second largest computer maker, agreed to develop and

supply Honeywell with a large-scale mainframe compatible with Honeywell's other machines. The product, called the DPS 90, began to ship this year.

On the receiving end

And Honeywell, which had traditionally provided technology for NEC to use in its Japanese products, was now, for the first time, on the receiving end. Earlier this year, Honeywell sold its Japanese operation outright to NEC.

Despite that, according to Jim Varrant, vice-president and group executive of Honeywell's U.S. Marketing and Service Group, the relationship between Honeywell and NEC is more than just a typical OEM agreement between a Japanese and a U.S. company. "Over the past 23 years, our president Edson Spencer has built many close relationships with people at NEC," Varrant says. "He is close to [NEC Chairman Koji] Kobayashi, and it is these rela-

tionships that carry us through. It is more characteristic of a Japanese business agreement where the relationship is key. It strengthens what we do together."

It is also helpful that in their long relationship, the two companies have built architectures and operating systems that are greatly similar. NEC's proprietary architecture for its large systems is called ACOS and is "extremely compatible" with

Honeywell's GCOS operating environment, Varrant says.

Under the agreement, NEC ships its S1000 CPU to Honeywell's Phoenix plant where it is fitted with Honeywell's communications front end and peripherals. Honeywell retains all distribution and manufacturing rights to the product in the U.S.

Varrant says the DPS 90 has "sold according to plan," and the two companies are currently working on a follow-up product in Japan. Though NEC controls the research

and development, Honeywell engineers closely monitor progress and provide input along the way.

Japanese origin made clear

Varrant notes that Honeywell sales representatives make it clear from the outset that customers are buying a Japan-built product. "We've never heard a negative comment," Varrant says. "Customers are pleased that Honeywell can support a product at the high end of the line."

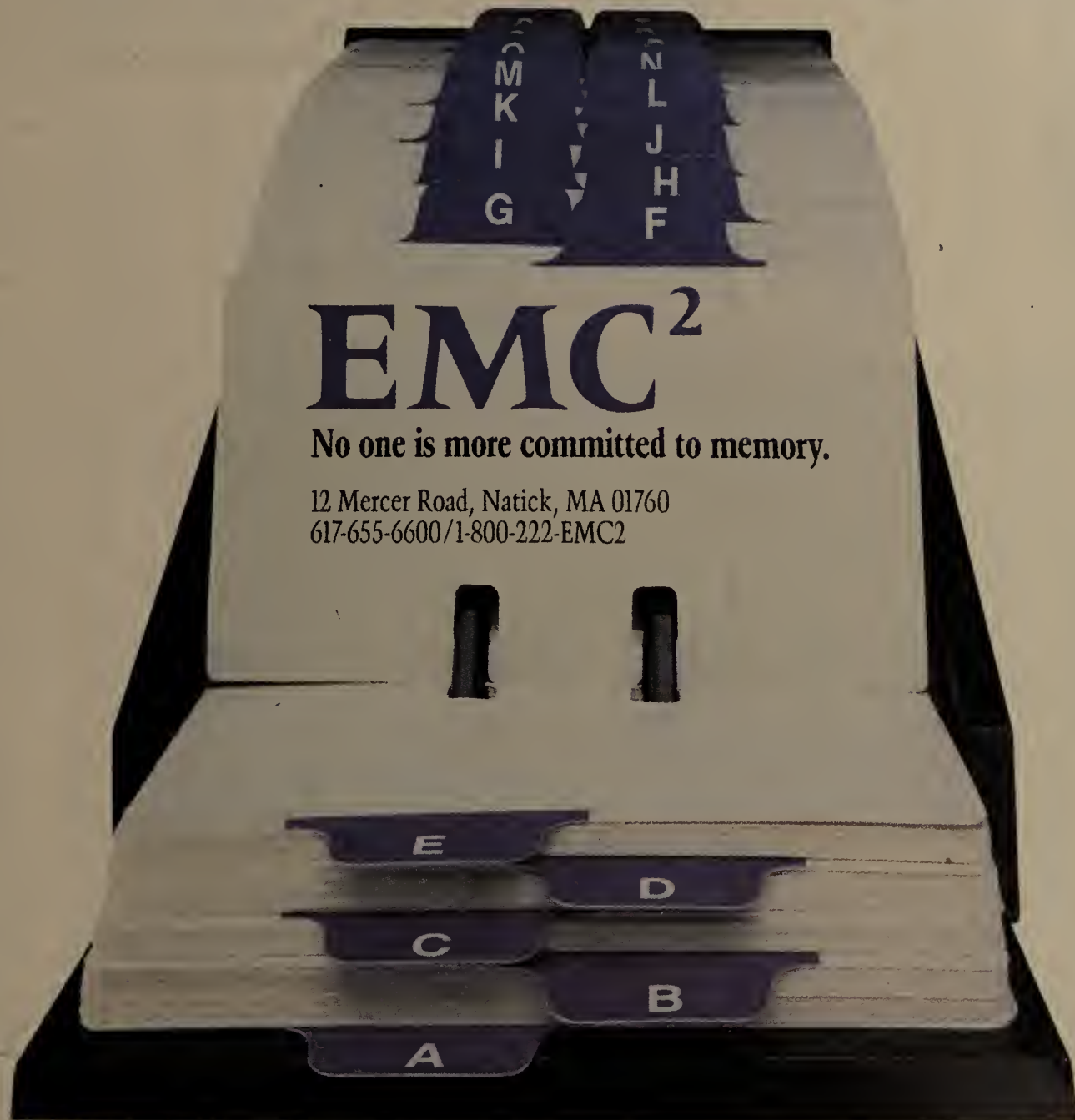
Those who closely monitor the Japanese computer industry point out that it is irksome to the Japanese vendors to have to sell their products under the name of a U.S. company.

"There is a lot of pride involved," according to Varrant, "but they are realizing more and more how difficult it is to penetrate the U.S. market on their own. Those who are successful will have a partner, and there aren't that many partners available."

— Glenn Rifkin

NEC & Honeywell

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Update

Continued from page 58

the culture gap. This is particularly true in different business fields. We have to make up complete menus, build up sales engineers and support staffs, and those people should be completely acclimatized to fit in the local market in the U.S. We will have to solve many problems before marketing large systems ourselves in foreign markets."

Though no one from Hitachi would comment, there is speculation that the company is seeking more OEM agreements for many different products in the U.S. computer market. It recently announced an agreement with Sperry Corp. on a large system connection.

Hitachi announced that it plans to open a manufacturing facility in Oklahoma to produce large-scale 3380-type storage devices in 1987.

NEC and Honeywell — These two companies are in the 23rd year of a cooperative agreement for the exchange of technology (see story page 64). Two years after signing an agreement calling for NEC to supply Honeywell with its largest mainframe, Honeywell began shipping the DPS 90 this year. Based on NEC's S1000, the DPS 90 is selling "on plan" according to Honeywell's Jim Verrant, vice-president and group executive for the U.S. Marketing and Service Group. IDC predicts that this connection will add only a percentage point or two to Japan's share of the large-systems market here.

NEC is clearly more interested in selling small systems and personal computers into the U.S. market.

In terms of large systems, the power of Japan Inc. clearly will provide little advantage for Japanese firms breaking into U.S. markets. MITI official Koichiro Urabe admits that the Japanese government is making no formal effort to help its firms gain a foothold in the U.S. "The administrative policies of MITI toward the domestic computer industry have never intended to boost Japanese computer makers' presence in the world computer market," Urabe states.

Medium-size, small systems

The Japanese made their nation a dominant industrial power by taking existing products — cameras, automobiles, television sets — improving them to the highest quality and using superior manufacturing capabilities to produce them for less money. This strategy has worked phenomenally well for products with long life cycles and technologies that are relatively stable.

In the data processing arena, however, technology changes too rapidly; product life cycles are much shorter; and in medium-size and small systems, as well as personal computers, the target is moving too fast for the Japanese style to have an impact.

Japanese firms hoping to penetrate the U.S. market are beginning to realize that it will be difficult to sell office systems and workstations without the add-ons that customers want most. Ironically, U.S. buyers either do not know or do not care that the contents of most personal computers, including the IBM Personal Computer, are manufactured in

Japan. Selling the total package is obviously another story.

"To be successful here you have to have a product that is responsive to the marketplace. To do that you have to have a partner in that marketplace helping you with product development and distribution channels," says John Rehfield, vice-president and general manager of information systems for Toshiba America, Inc.

In the small systems and workstation arena, the cultural differences between Japan and the U.S. come into play once again. The Japanese have spent an inordinate amount of time incorporating Japanese language capabilities into their machines. This difficult endeavor has kept them from concentrating on foreign markets, and industry analysts are skeptical of their chances at this late date.

In the mid-range U.S. market, the Japanese hold a negligible (0.3%) share. According to IDC, only Hitachi — through NAS — is selling an IBM 4381-size machine in this country, and the outlook for increased competition on that level seems dim.

In the minicomputer market, the Japanese have established virtually no presence on U.S. shores.

Digital Equipment Corp., the leader at home, is also the top seller in Japan. Unlike in the U.S., where vendors have chosen certain markets in which to specialize, the large Japanese vendors tend to supply everything — computers, communications, semiconductors — at all levels for their customers.

For a Japanese supplier to break into the U.S. market, it would have to take on DEC, IBM, Wang Laboratories, Inc., Hewlett-Packard Co., Data General Corp. and others. Businesses, analysts say, are unlikely to want to bring yet one more proprietary operating system into their environments. Japanese vendors are turning to AT&T's Unix in hopes that this portable operating system will help them extend into new markets.

Nonetheless, the Japanese have begun to create some eye-catching products, and vendors like Toshiba Corp. are clearly looking to the U.S. as a potential feeding ground.

According to Toshiba's Shigenori Matsushita, chief engineer of the in-

formation systems business group, his company focuses on a distributed office system environment based on departmental processors. Using its shiny new headquarters in Tokyo as a working example, Toshiba has pushed Japanese office automation to new limits.

tion processor attempting to replace the standard bipolar emitter-coupled logic chip — the G8050 reportedly runs at 5.6 million instructions per second (MIPS) compared with 4.8 MIPS for the VAX 8600.

Matsushita points out that the new machine is the first in the world

to use a CMOS gate array device utilizing silicon-on-sapphire technology. The sapphire, which acts as an insulator, is covered with a thin layer of silicon. Because the substrate of the chip is insulated, the circuit can operate faster than competitive chips. The sapphire, of course, is expensive and raises the cost of the machine. Up to four processors can be linked to the main memory unit and in that configuration can run at 18 MIPS.

The system will sell for approximately \$400,000 in Japan. Matsushita acknowledges that Toshiba plans to market the G8050 in the U.S. through an OEM agreement with a yet-to-be-named vendor. That agreement is expected within the next five months.

Though other major Japanese vendors, such as Hitachi and Fujitsu, also offer "total-solution" systems, it appears unlikely that any will become major players in the U.S. market any time soon.

It would be a surprise to corporate America if they did. According to a recent survey of 243 U.S. firms by the Omni Group Ltd., a New York research and consulting firm, only 10% reported purchasing Japanese-brand office computers compared with 98% who reported installing American-made systems (see chart page 68). David Cushing, associate director of the Omni Group, says that the No. 1 reason for resistance to purchasing Japanese office systems is compatibility. Cushing points to emerging standards, such as IBM PC-DOS on the personal computer level and says, "The Japanese have been slow on the uptake to adopt these standards. They are missing the boat."

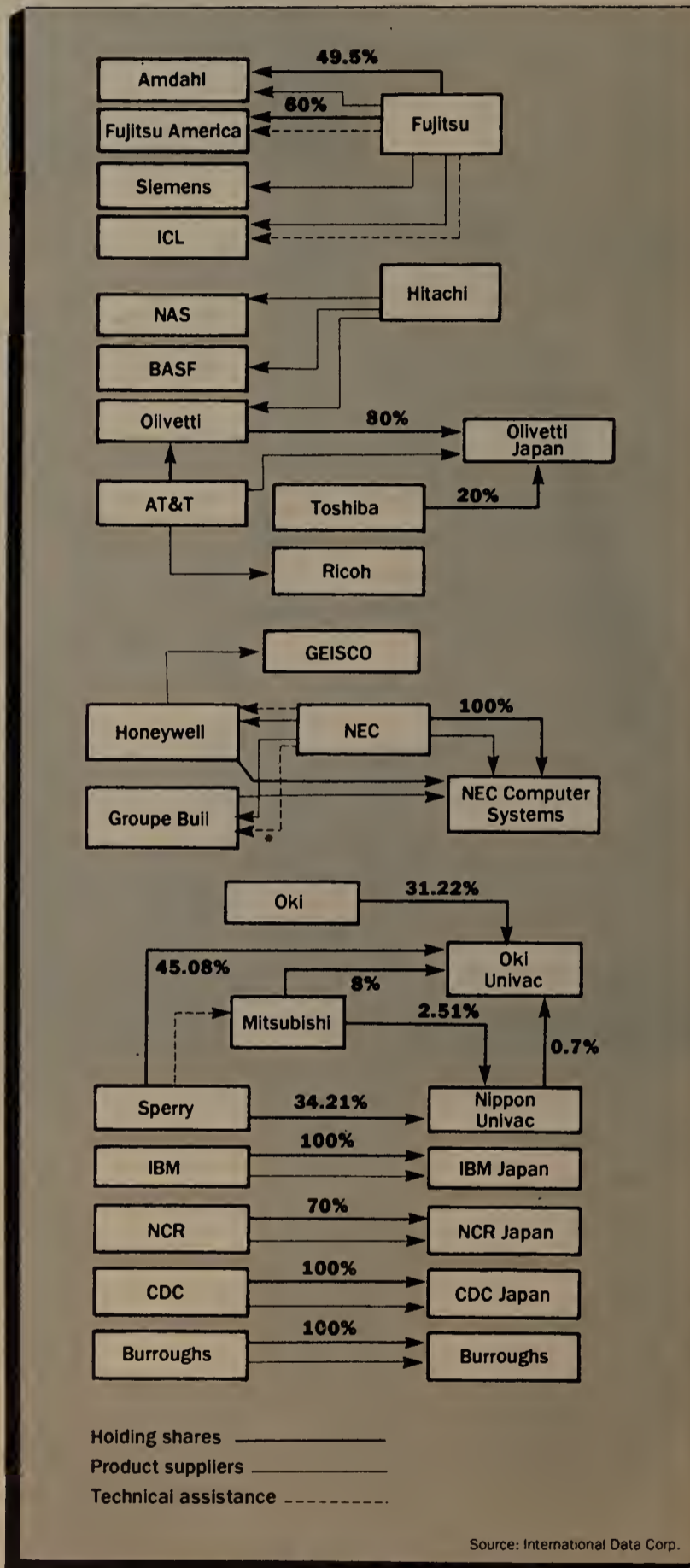
The survey revealed that only 13% of Fortune 1,000 respondents thought that Japanese products would have the highest compatibil-

ity with existing office systems. Given the importance U.S. companies place on systems compatibility, the survey states, these unfavorable perceptions pose a strong entry barrier to Japanese vendors.

"They may think that what sells in Tokyo will sell in Toledo, but they haven't convinced the MIS director that they can offer fully compatible systems," Cushing says.

In addition, the survey points out that service and support is a major stumbling block to acceptance. At least 85% of respondents believe U.S. vendors offer the best service for office computers. "Our past studies

MAINFRAME MAKERS' INTERNATIONAL TIE-UPS



The building, Matsushita explains, houses 7,000 Toshiba employees. A network of 51 departmental processors are connected by two types of local-area networks: a 100M-bit optical backbone network connects with a 10M-bit Ethernet system on each floor of the building. More than 1,000 workstations hook up to this network.

To back up its philosophy, Toshiba recently unveiled a 32-bit superminicomputer called the TOSBAC G8050, reportedly faster than the DEC VAX 8600. Utilizing Japan's own CMOS technology — a low-cost, high-density, low-power-consump-

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have shown that U.S. customers place an extremely high value on vendor-supplied service. Unless Japanese vendors build their image as service providers, it could put a damper on their success," Cushing states.

Despite the survey results, Cushing believes that the Japanese could well be a medium- to long-term force to be reckoned with in office systems. As the office automation world conforms to a set of standards, it will give the Japanese a target for their price/performance advantages. The large Japanese vendors have so many divisions and varied product lines that one division can carry another through bad times, and this gives them a longer window of opportunity, he says.

Dale Kutnick, an independent consultant based in Wayland, Mass., says that the only real opportunity for Japanese office systems vendors is if the Unix operating system becomes a standard. Fujitsu's Hiraguri agrees and says that Unix has already been announced on its mini-computers. "We are now making an effort to make Unix a standard for our machines; the export potential is secondary," he says. "But of course, if we make Unix a standard, it can have an effect that maybe an American user can appreciate."

In that regard, Toshiba is incorporating Unix on its office automation workstation as well as its engineering workstations. Toshiba recently announced an agreement with Sun Microsystems, Inc., a leading supplier of Unix-based engineering workstations, to add Japanese language capabilities to its workstations. That connection may have significance in the future in the U.S. if Sun decides to bring in technology from Toshiba.

In the long run, the Japanese vendors may change their outlook. But for now, most echo the sentiments of Toshiba's Matsushita. "In my opinion," he says, "I don't want Toshiba to be a predominant participant in the U.S. That is not our objective. Our objective is to survive in the domestic market as a systems provider. To survive, we have to have some areas of the U.S. market, but not as a primary objective."

"In the U.S., the most difficult thing for us is having systems engineer support for the customer. Nowadays, computers are more and more application oriented, and more non-experts are using them. So today, computers are very influenced by a country's culture, and the most difficult part in selling abroad is the adaptation to the culture. That is why American computer manufacturers are not successful in Japan and Japanese are not successful in America. We would need a large population of systems engineers, and that is very difficult as a business investment. As long as this continues, the dominance of Japanese manufacturers in the U.S. will not happen."

Personal computers

The personal computer marketplace has been perplexing for the Japanese at home and even more confusing in the U.S. On the surface, it seems that personal computers were a perfect stepping stone to suc-

cess in the U.S. The Japanese could take the standard model, produce it better and cheaper and flood the market through retail dealers who would provide service and support. Thus far, that scenario has not materialized.

Slow to adapt to IBM's PC-DOS standard, the Japanese have concentrated on getting Kanji character handling capabilities on their domestic machines and have put little effort into the U.S. market.

Companies like Toshiba, Fujitsu and Panasonic Industrial Co. tried to get into the market in 1982 and failed. In 1984, IDC reported that Japanese vendors held just 2.6% of the personal computer market and predicted even lower numbers this year.

"With the personal computer market virtually standardized around PC-DOS, it might seem that there would be an opportunity for the Japanese vendors to come in with a low-priced version of the IBM [Personal Computer]," the IDC report states.

"But since personal computer technology continues to move very rapidly, it is still hard for the Japanese to gear up to produce high volumes of the right product at the right time."

"It's too much of a moving target," Kutnick adds. "They can't come in, pick a spot and go after it."

Never known for innovation, the Japanese lag behind in the swiftly changing world of the personal computer. While IBM and other domestic makers switched to 16-bit technology, the Japanese were still pushing



Toshiba's Matsushita: 'Our objective is to survive in the domestic market.'

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8-bit machines in 1984. The DP/MIS director, already inundated with IBM Personal Computers, is unlikely to start bringing in incompatible Japanese machines, and the consumer market has its own set of barriers. There is, for example, a subtle but key difference between selling autos or electronics and personal computers.

In his new book *IBM vs. Japan: The Struggle for the Future* (to be published by Stein & Day Publishers in January), Robert Sobel points out that comparison shopping in computer stores has not been a plus for the Japanese as it has been in autos and electronics. "The comparisons weren't favorable, in part because IBM and Apple Computer, Inc. had excellent reputations by then, but more important was the matter of selling both a technology and a product," Sobel writes.

"The person who test-drove a Toyota in the 1970s probably had owned a Chevy or Ford; the shopper for a Sony color set a decade earlier had an RCA or Zenith at home. Not so for the first-time purchaser of a micro, and as it turned out, he preferred the familiarity of a domestic model."

Interestingly, the Japanese are now faced with tough competition in their own backyard as the effort to create low-priced, quality machines for export intensifies. The "Four Dragons" — Seoul, South Korea; Hong Kong; Taiwan; and Singapore — are vigorously pursuing the IBM Personal Computer-compatible market, and it will be all the Japanese can do to fight them off in the domestic market.

All that said, several Japanese vendors such as Toshiba, Panasonic, NEC and Mitsubishi Corp., have not given up on the U.S. market. Toshiba's Matsushita admits that mere IBM compatibility is not enough for the Japanese to grab significant market share.

"We believe something must be added, but if something is added which impacts the compatibility, that is no good. The compromise between compatibility and something new is the key to success in this field," Matsushita says.

Toshiba has combined very large-scale integration technology and a compact body to produce its 16-bit, IBM Personal Computer XT-compatible T1100. Already selling in Europe, it will soon be introduced in the U.S.

NEC is also aggressively marketing personal computers, and it has its own production plant in Massachusetts to manufacture its machines. The products, however, are not selling well due to incompatibility with IBM.

Whether the Japanese can overcome the initial obstacles and make a dent in the marketplace remains to be seen. It is difficult to write them off in a market area still evolving and growing. (The IBM Personal Computer is, after all, not yet 5 years old.)

But as the IDC report states, "No major assault on the personal computer market is perceived as imminent."

Future systems

Japan's future in the U.S. computer market may rest not with current technology but in the next generation of information processing. The Japanese are making a well-publicized attempt to create advanced, intelligent, superfast systems with cooperative efforts that strain the ties that bind Japan Inc. Depending on which sources one chooses to believe, the Japanese will either leap into the No. 1 spot in the world's information systems market or simply plod along like everyone else toward tomorrow.

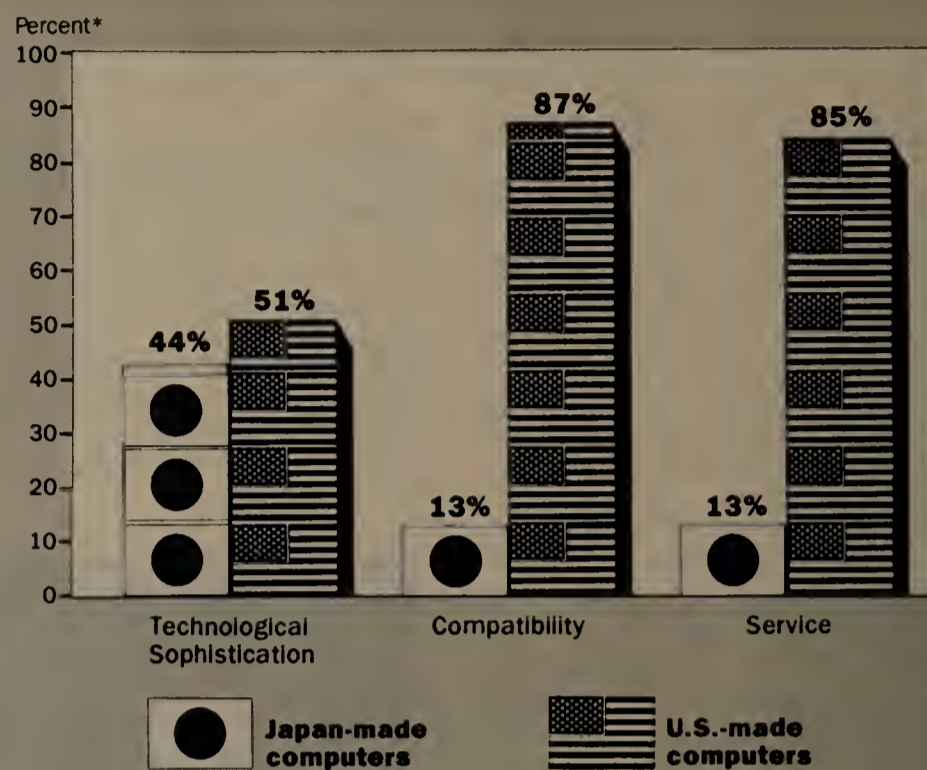
Among recent commentators, author Feigenbaum set off the most furor with his 1983 book *The Fifth Generation*, in which he wrote, "The Japanese have seen gold on distant hills and have begun to move out. . . . The consequences of complacency, of our spirited attention to the present at the expense of the long view, will be devastating to the economic health of our most important industry. The Japanese could thereby become the dominant industrial power in the world."

Others, such as Theodore H. White, believe the Fifth Generation project represents just part of a calculated attack on U.S. commerce. Writing in *The New York Times*, White says, "Today, 40 years after the end of World War II, the Japanese are on the move again in one of history's most brilliant commercial offensives, as they go about dismantling American industry. Whether they are still only smart, or have finally learned to be wiser than we, will be tested in the next 10 years. Only then will we know who finally won the war."

The U.S., in fact, is not sitting idle while Japan works [CW, May 6]. Major research continues at American universities and corporations on artificial intelligence, parallel processing and advanced systems fueled by vast funding from the Department of Defense.

The Japanese acknowledge openly that they are working on future technologies through private, corporate and cooperative government-sponsored projects. But they also point out clearly that

U.S. VS. JAPAN



U.S. decision makers favor U.S.-made computers in three key categories.

vances of the Japanese? They are our allies. They're not making weapons."

MITI, in fact, encourages cooperative agreements with foreign researchers, though no official pacts have been announced. Said one MITI official, "When the ICOT Project was inaugurated four years ago, close exchange with international organizations was promoted because all these projects relate to untapped technologies. International cooperation will be required all the more because it is very important to establish international standards for new languages and parallelization."

MITI — through its Agency of Industrial Science and Technology — is funding four major computing projects for the purpose of leading Japan to the "age of informationization."

■ The ICOT Project. Known generally as the Fifth Generation project, this research is devoted to the study of artificial intelligence, parallel processing, translation systems, vision systems and more. Begun in October 1981 and funded for \$850 million over 10 years, it is a cooperative arrangement in which the leading Japanese vendors send top researchers to ICOT for three years of joint development work. The project is divided into three segments. Phase I — a catch-up period — ended this year. Phase II — the intermediate stage designed to create actual demonstration systems of initial research — is scheduled to run until 1988. The final phase for implementation has no detailed schedule but should reach completion in 1991.

■ The Superspeed Computer Project. Getting less attention than the Fifth Generation project, this national project got under way in January 1982 to develop high-speed computing systems for scientific and technological use. The project, scheduled for completion in 1989, aims to produce a 10 billion floating-point operations per second (FLOPS) machine. The \$100 million project has already entered its commercial phase. Its three major activities include R&D on parallel architectures and software; development of new high-speed devices, such as Josephson junctions, gallium arsenide and high electron mobility transistors; and construction and evaluation of the final system.

■ The Sigma Project. This major project focuses on elevating the productivity of software development. Japan is predicting a shortage of 600,000 software programmers by the year 1990 if the nation does not take significant action. The lack of

JAPANESE PERSONAL COMPUTER SHIPMENTS TO U.S.

Vendor	1983 Shipments	1984 Shipments
Canon, Inc.	200	675
CIE Systems, Inc.	426	870
Epson Corp.	41,000	51,000
Fujitsu Ltd.	3,995	15,000
Mitsubishi Corp.	—	30,500
NEC Corp.	13,500	15,500
Panasonic Industrial Co.	—	5,000
Pentel of America, Ltd.	200	50
Sanyo Electric Co.	7,000	30,000
Sharp Corp.	1,000	19,000
Seiko Instruments U.S.A., Inc.	700	1,000
Sony Corp.	200	700
Sord Computer Corp.	200	8,600
Toshiba Corp.	4,100	1,000
Total	72,521	178,895

Source: International Data Corp.

their efforts are evolutionary, not revolutionary.

Those involved in the projects as well as industry analysts downplay the "us vs. them" aura that the work has taken on.

"Is there a race between the U.S. and Japan?" ETL's Kashiwagi asks. "Races have rules. You obey rules to run it. But tell me, who will make the rules in this race? Japan and the U.S. must cooperate as well as compete."

James Abegglen, management consultant and professor at Sophia University in Tokyo, adds, "The melodramatic view of all this is simply not useful. Why should we be concerned about technological ad-

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software development expertise has long been a Japanese impedance, and several of the major companies are participating in the Sigma Project.

■ The Interoperability Project. In this cooperative effort, manufacturers are working to increase interfaces between incompatible systems. The focus is on constructing multimedia data bases and furthering distributed data processing in Japan.

Urabe says that MITI is seeking funding for another project that will promote cooperation between Japan and less developed countries in the computer industry. Among the challenges of the project will be to build computer-aided translation systems between the Japanese language and the languages of the less developed countries.

Since it was originally announced, sending the U.S. computer industry into a panic, the Fifth Generation Project has not had a smooth ride. Though MITI officials claim that the project progresses right on schedule, the bloom is apparently off the rose. Major computer companies such as Fujitsu hesitate to send their best people off to ICOT and sacrifice short-term potentially profitable research for yet unknown group gains.

"Under the Japanese employment system, most companies have trouble sending these people out for a long period of time," Kashiwagi admits. "If it doesn't bring profits to their own company in the short run, they are not likely to do it. It's the same in Japan as it is in the U.S."

Reports also indicate that MITI funding for ICOT has declined, and the government realizes that it set unreasonable goals for the project.

Kashiwagi says that the transition of personnel for ICOT between the first and second phases of the project went smoothly despite the reported problems. He acknowledges, however, that the researchers in the second phase will have less freedom than those in the first because the project migrated from basic research to product development. "Freedom will naturally decrease in the new period," he says, "and then ICOT may not be good enough for those researchers who seek the same freedom they had in the first stage."

According to IDC's Ogino, these creative individuals are turning more and more to independent, third-party development companies, a heretofore unthinkable route for the Japanese. With the country's renowned lifetime employment, it remains extremely difficult for independent ventures to survive without government support or a lifeline to a major firm. If a new venture does find a *sukima* or niche, a bigger firm often snatches it up. "The number of new ventures is still very small," Ogino says, "but we are starting to see some small software developers, for example, have success."

For the Japanese to attain success in the fast-moving U.S. computer market, many believe they must encourage more of this individualistic thinking. The large vendors feel they are encouraging that attitude in-house with work on state-of-the-art systems.

In the supercomputer arena, for example, Fujitsu, Hitachi and NEC engage in head-to-head battles in Ja-

pan for dominance of that specialized market. Fujitsu recently announced its VP 50 and VP 400 models, and Hiraguri indicates that the company looks to Amdahl as a channel of U.S. know-how in this area. No sooner did Fujitsu unveil its top-of-the-line VP 400 (with a reported speed of 1.14G FLOPS), then NEC announced it was shipping its first supercomputer, the SX-2 with a rating of 1.3G FLOPS.

Whether companies like Fujitsu can find success marketing supercomputers through U.S. manufacturers remains to be seen. In such a small market, it is doubtful that a vendor without a service presence will do well, but the Japanese makers indicate that they are looking for a global audience for their machines.

Fujitsu is also pioneering the artificial intelligence field in Japan. Though ICOT chose Prolog as its language of choice in the fifth-generation push, Fujitsu recognizes a strong market potential for LISP, the U.S.-favored AI language. Fujitsu markets the Facom Alpha, a LISP processor that already has stirred widespread interest for companies looking into expert systems in Japan, according to Hiraguri. He says that Amdahl expressed interest in selling the machine in the U.S.

In addition, Fujitsu is demonstrating the Atlas, an artificial translation machine that automatically translates Japanese to English and vice versa.

Companies like Toshiba are also involved in advanced research and



MITI's Urabe: Hoping for cooperation with less developed countries

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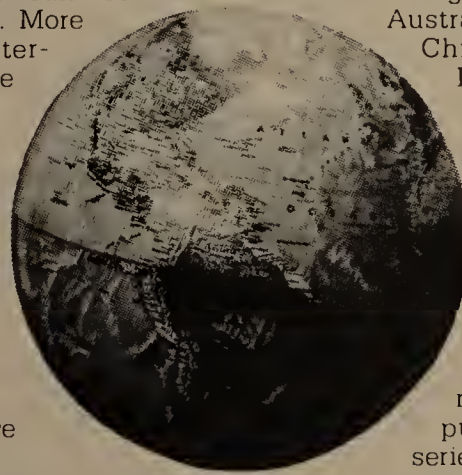
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development but with more practical, short-term goals in sight. As part of the ICOT group, Toshiba engineers designed a relational data base machine. But for its own business, the company is heavily involved in promoting its advanced office systems approach. It developed a unique image processing expert system to address a major need in Japanese document handling and optical-disk technology for the records-handling crunch that has long plagued Japan.

The recent liberalization of Nippon Telegraph & Telephone Corp. (NTT) opened up the telecommunications market in Japan, and computer vendors are scrambling for a piece of the value-added network market. Deals between NTT and U.S. vendors such as IBM [CW, Nov. 18] put even

It is clear that the Japanese manufacturers are no more fixated on world domination than anyone else.

more pressure on Japanese manufacturers.

Concentration on domestic markets leaves little time for Japanese vendors to devote R&D cash to U.S. computer needs. Where those needs cross over to machines created for home use, vendors will undoubtedly make attempts at marketing abroad. But it is clear that the Japanese manufacturers are no more fixated on world domination than anyone else. In fact, they tend to debunk the

Japan Inc. label as inaccurate and misleading.

According to Toshiba's Matsushita, the government does take the initiative on occasion in deciding direction for industry, but the reverse is more often true. "Actually, individual companies give their opinions first, and this directs the policy of the government," Matsushita states. With so many companies expressing individual concerns, conflicts and contradictions arise on many occa-

sions. The veil of harmony exists, more often than not, in the pages of books written by overzealous or uninformed writers.

Upon investigation, it becomes clear that the Japanese have yet to repeat in the U.S. computer arena what they've accomplished in automobiles and electronics. Both they and their U.S. counterparts remain skeptical of any such domination in the future. Despite trade imbalances and increased anti-Japanese feelings in the U.S., both countries expect increased rather than decreased cooperation between computer makers in the future with both sides reaping the benefits. For now, the competition remains keen.

As Kashiwagi puts it, "Even in competition, there is cooperation." ■

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Continued from page 64

small business computer line.

NEC has a long-term relationship with Honeywell and sells its large mainframe to Honeywell, which resells it as its large system.

Toshiba Corp. Toshiba's U.S. subsidiary, founded in 1965, is a \$1 billion company that sells and services industrial and consumer electronics. The business microcomputer segment is Toshiba's target market.

This year, Toshiba took the first step in acquiring Sord Computer Corp., a small but innovative personal computer maker in Japan. Sord's expertise in personal computers will benefit Toshiba.

This acquisition should be instrumental in successfully developing and marketing personal computers, an area where Toshiba has been anything but successful.

Mitsubishi Corp. In 1973, Mitsubishi Electric America was established. The U.S. sales for 1984 were about \$800 million.

Mitsubishi Electric America sells products manufactured in Japan by Mitsubishi Corp. Products are all currently sold through the OEM channel.

Its personal computers, for example, are sold in the U.S. market through Sperry Corp. and Leading Edge Products, Inc.

Other products include disk drives, printers and monitors.

Japanese vendors are slowly learning how to succeed in the U.S. market, but it has been a long and flawed education. The cultural differences have proven difficult to overcome; U.S. computer makers trying to sell in Japan face a similar obstacle.

The U.S. marketing style is very different from that of the Japanese. U.S. businessmen tend to be more aggressive and move quickly, whereas the Japanese like to take the time to develop a relationship with their customers. Translation: a longer sales cycle that may result in a lost sale.

The primary reason for the success of the Japanese is their ability to come to market with a high-performance, low-price product. Perhaps better than any other nation, Japan has the ability to manufacture technically sound products priced at the lower end of the spectrum.

How Japan will fare with that capability in the U.S. computer market of the future remains to be seen. It would be unwise, however, to discount the potential of the Japanese. ■

IN DEPTH

Managers find they can't proceed from theory to an actual plan in an environment where fundamental assumptions become obsolete monthly. One company's response — focusing on the planning process and the ability to manage change, rather than writing a static long-range plan — allowed MIS to reap the benefits of ever-changing information technology.

Planning amid change

By Vita Cassese, William Gruber and Max Hughes

Senior executives and information managers today are confronted with an extraordinary array of forces that make the construction of a strategic plan for information systems particularly difficult. The forces include the following:

The proliferation of technology.

A lack of integration among technologies, both across manufacturers and from the same vendor.

Major technology gaps, such as in micro-mainframe links and word-processing and data-processing links.

Pressure from users who expect effective access to technology that in reality is not user friendly.

Pressure from top management to cost-justify where the benefits are not fully known or not quantifiable.

Systems managers and business managers who have attempted long-range information systems planning often have difficulty in proceeding from theory to an actual plan. They have difficulty deciding what the plan should address and sorting out policy from strategy, technical decision and management and control in an environment in which nothing is stationary

and fundamental decisions and assumptions are made obsolete with the next issue of their favorite computer journal.

In short, these managers cannot focus: They cannot get to the point of making a coherent statement about where they are going, why they are going there and how they are going to get there.

Systems management at one firm, Pfizer, Inc., responded to this challenge. Following is an account of this large company's effort to effect a significant reordering in management practice to bring about the orderly management of change.

The planning process

The speed of change at Pfizer has been so rapid that systems management decided to focus on the planning process and the ability to manage change rather than write a static long-range plan. To begin with, the senior systems managers went off-site for three days in order to initiate a program for systems planning. They established certain guidelines for the planning process:

- Identify audiences or users for the systems long-range plan.
- Define the purposes or objectives of systems planning.
- Identify the issues to be managed by systems planning.
- Group issues into the strategies required to manage those issues.

Vita Cassese is director of systems for the Pharmaceutical Division of Pfizer, Inc., New York. William Gruber is president of Research & Planning, Inc., a Cambridge, Mass., consulting firm. Max Hughes is vice-president of systems and communications at Pfizer.

IN DEPTH/PLANNING AMID CHANGE

■ Implement a program of managed change.

Senior systems managers arrived for the three days of off-site planning with a strong intuitive understanding of the "vision" behind managing change. They were well aware of the issues to be managed by the planning process.

The commitment of senior systems managers to the planning process came in response to their need to articulate an almost-formed vision. They initiated the process to complete the vision of new roles for information systems and to achieve an action plan for translating the vision into practice.

The managers' focus on this vision played a pivotal role, for it transformed the whole process from reaction to proaction. Their proactive approach transformed the role of

"

Users, like senior management, need confirmation that their real goals are understood, that the role of information technology is appreciated and that a road map for getting from today to tomorrow is created and revised as conditions change.

systems management from satisfying the aggregate need of all end users to one of leading the organization in the adaptation of technology to its greatest advantage.

Increasingly, systems management recognized that they had no clear road map for carrying out all the required changes. Some decisions were made to satisfy only immediate

needs; other decisions were delayed until some larger, prerequisite decision had been made. In short, the managers felt intellectually gridlocked.

In this state, they could obviously not communicate their vision. The planning process was initiated to correct this inability to communicate the proactive vision of senior sys-

tems management.

The first day of the planning process involved the brainstorming of issues, in no particular order. Not all issues were of equal importance. Some of the more important issues include the following:

■ Was the system going to consist of a three-tier architecture, with an intermediate computer between the corporate mainframes and the micros; or only two tiers, mainframe and micros?

■ How could documents be transferred between Wang Laboratories, Inc. word processors and IBM Personal Computers?

■ Was a three-vendor strategy employing Digital Equipment Corp.'s All-in-One for electronic mail, Wang for word processing and IBM for data processing a viable option, or should management attempt to reduce the number of vendors to one or two?

■ What was the stated and actual strategic direction of the major vendors?

■ Was electronic mail here to stay and if so, whose software would be used?

■ Who was going to call the shots on what cables to install in the office buildings, since a master communications plan had not yet been developed?

■ If all the end users had substantial computer power on their desks, what were the future roles of the systems staff?

■ Who was the guardian of the data — who "owned" the data?

Constituencies for planning

While all these issues were being raised, the flow of the talk was frequently interspersed with "So-and-so must understand that . . ."; "We'll never get him to agree to . . ."; "That will really satisfy his wanting to have . . ."; "What is corporate policy on . . .?"; "We've got to think our way through . . ."

Ultimately, conversation halted with "Look, we've got to define who the audience is, or we'll never be able to write anything down." And so, the group systematically identified the various audiences that the plan would serve.

Senior company management.

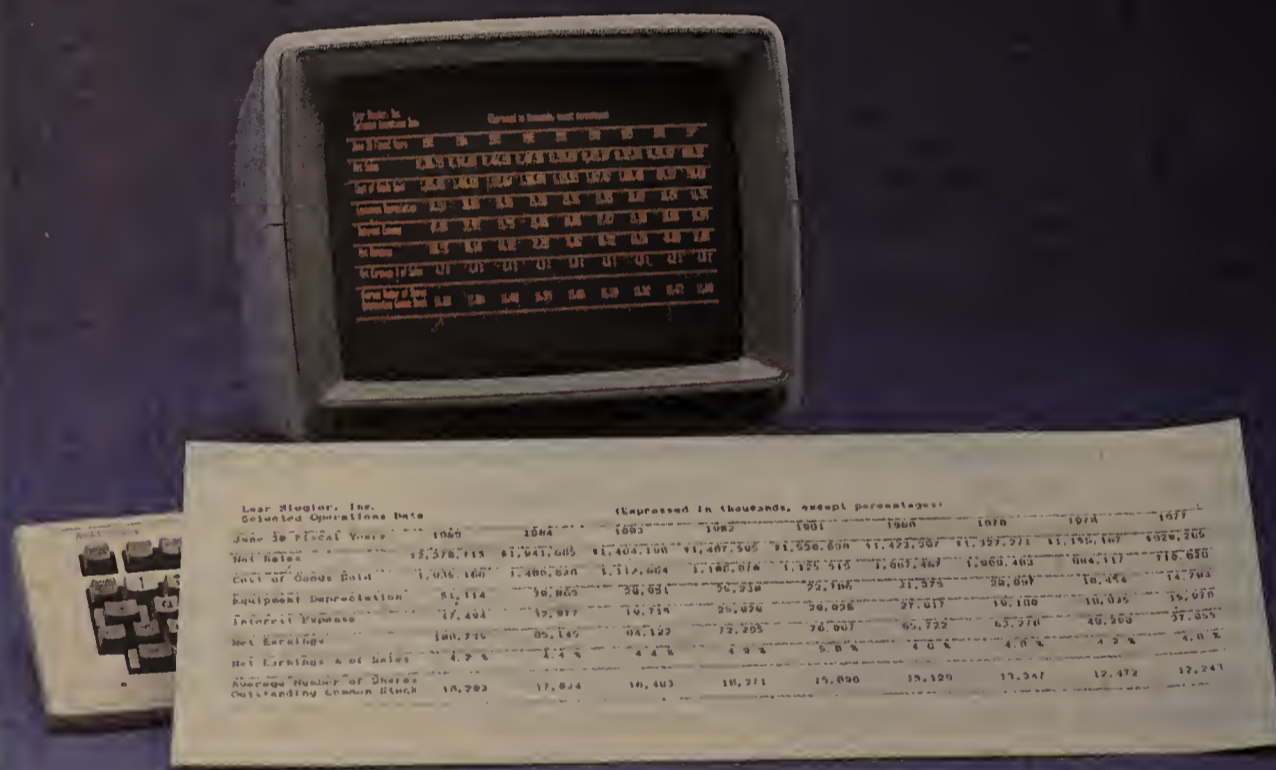
Senior management has to be assured that systems management had a plan that provided cost-effective information technology while balancing vendor hype — to which senior management is subjected at every turn — with the realities of running a business.

Senior management deserves the comfort of knowing that the influx of personal computers and office automation is part of some overall plan. Furthermore, their active support is needed not only for visible expenditures but also for acquiring from their subordinates the required time and energy commitments to learn and take advantage of modern computer technology to achieve a business advantage.

Users. Users expect to behave as individuals with regard to information processing. They are led to believe that data will be instantaneously available, that all software packages are "user-friendly" and apparently require neither a definable problem nor definable solution to be installed.

Users, like senior management, need confirmation that their real goals are understood, that the role of

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IN DEPTH/PLANNING AMID CHANGE

information technology is appreciated and that a road map for getting from today to tomorrow is created and revised as conditions change. Their support is needed in at least two ways: participation in the more detailed planning that would follow and tolerance for compromise solutions that would satisfy a much larger group.

Corporate information processing staffs. At Pfizer, significant expenditures for computers are subject to review by the relevant corporate staffs, and telecommunications is a corporate function. Therefore, these groups need to understand and support the plan, particularly if any action under consideration either departs from the relatively few absolute policies that existed or requires active cooperation between these corporate groups.

For example, the plan calling for intermediate computing required that an appropriate machine be bought, which it was, with the corporate groups participating in the selection of a particular machine.

The systems staff. The advent of the current wave of information technology, the influx of personal computers, the acceptance of fourth-generation languages, the reordering of data to data base format and so on provided new opportunities for systems personnel. But for some, these changes also posed a challenge to their roles.

Furthermore, without the wholehearted support of those who were to translate plans into reality, the whole exercise would be a blueprint

of nothing. The plan also afforded an opportunity for the staff to see the assumptions under which their own managers were operating and either back the assumptions or stand up and debate them.

Systems management. As with any document of this nature, the writers, not the readers, derived the most benefit from the planning proposal. Here lay the instrument to examine and debate all of their assumptions and to reach a consensus. With these agreed upon, making change happen smoothly was not trivial, but at least systems management collectively knew what they were trying to achieve and why. Indeed, even if no one else read the plan, the immense value that accrued to the writers more than justified the whole exercise.

Why plan?

Just as the discussion of issues was interspersed with asides concerning the audience, the writing of the plan was disrupted with "Why are we doing this?"; "What is our real purpose?"; "Is this really going to help?"; "Do you think anyone is actually going to wade through this plan?"; and so on. Again, participants recognized that formally answering these and allied questions would provide essential guidance to the format and content of the plan. The group decided that the plan would provide the following:

- A framework for making day-to-day decisions.
- A vehicle for securing the cooperation and commitment of others.

Software strategy outline

SCOPE

Intermediate computer software.

OBJECTIVE

To establish a corporate software policy for information systems.

BACKGROUND

Software costs are significant (purchase price alone can be in excess of \$100,000) and must be carefully managed.

In the past, systems professionals needed to be familiar with one or two DP languages and one computer. The advent of personal computers and word processors and a plethora of software for each has enormously expanded the knowledge now required.

Software and hardware continue to proliferate, placing additional demands on those responsible for developing applications.

Selection of appropriate software is critically important yet increasingly complex because of the following factors:

- Many products perform essentially the same functions.
- Efficiency and functionality have to be traded off; software can be written to do a few things exceedingly well or many things somewhat less efficiently.
- A package that is optimal for one application may be inappropriate for another.
- Some evaluation methodologies used by systems managers contain over 100 evaluation criteria.
- Establishing the relative importance of functions is difficult.
- Many of the criteria are subjective.

Avoid using marginally different software packages performing the same function, since it is unnecessarily expensive in terms of initial cost, training and consumption of hardware resources. The standardization of software must be balanced against the benefits of selecting optimal software for each application.

Good software should facilitate access to data; facilitate end-user

computing; maximize responsiveness to changed requirements; and maximize the productivity of systems professionals.

The growing demand for centralized data requires appropriate data management software.

The growing demand for ad hoc, unstructured inquiry is increasing rapidly and in turn raises the demand for appropriate, easy-to-use, query software packages.

The demand for direct access to data by managers and professionals is increasing rapidly, particularly for further analysis on personal computers.

Because of the importance and complexity of selecting software, selection standards and criteria are needed.

The company must select software that will fit in with prior expensive software purchases, such as a data base management system.

STRATEGIES

Where possible, avoid using procedural languages (such as Fortran, Cobol and Basic) in favor of contemporary nonprocedural packages focused on data base management, decision support, graphics and spreadsheets.

Use, wherever possible, applications packages that are available in the marketplace, rather than building systems from scratch.

Gear software selection to facilitate end-user computing.

The installed DBMS package will be the first choice of data base management packages for other applications for the intermediate (second-tier) computer.

To capitalize on the benefits of contemporary software packages, the aging minicomputer will be de-emphasized in favor of hardware for which software is more available.

Decisions will be aimed at software standardization in order to make effective use of limited systems resources, including hardware capacity and systems staff.

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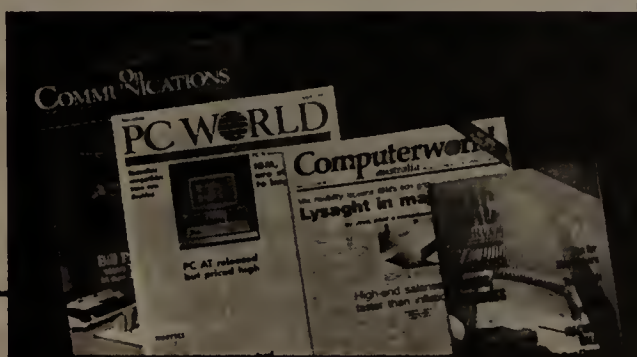
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IN DEPTH/PLANNING AMID CHANGE

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Instituting a planning process is the single most important factor in managing the changes required in organizations as they seek to reap the benefits of ever-changing information technology.

■ A way of communicating systems management's vision.

■ A statement of systems management commitment to manage change within information resources.

■ A means of eliciting viewpoints from others.

The issue identification process produced 75 issues affecting the performance of Pfizer systems. The process of grouping and analyzing issues found eight domains to be addressed.

The next stage in the process was to develop an action plan for each domain. Planners developed these plans over several weeks, using a draft document to record their decisions. The format adopted for each domain was as follows:

■ Scope. Overall mission and focus used to introduce the strategy.

■ Objectives. The benefits to be achieved from the strategy.

■ Background. Listing of

issues identified in the first day grouped under the strategy and annotated with facts on trends, problems and opportunities.

■ Strategy action plan. List of actions required to implement a given strategy.

Garnering support

Drafting the plan not only identified myriad issues but also explicitly identified just whose cooperation and support was needed, which in turn led to a plan to secure that cooperation.

The first phase was to give early drafts to those end users whose management, over the years, had been identified as knowledgeable and influential in information technology issues. As anticipated, these users provided insights toward wider acceptance of the plan and contributed added input to the substance.

At the same time, certain key corporate staff managers were exposed to the plan. They reacted favorably and became committed to making the plan work.

Initially, the systems staff, the next group of users to be involved, were not uniformly persuaded of the plan's benefits. Indeed, it was not until management presented the first formal annual update, coupled with a review of progress to date, that the plan gain the systems staff's enthusiastic support. Their skepticism may be attributed to wariness of — and weariness of — false promises.

Senior management was exposed to the plan in two ways: as it affected them individually, as members of the budget review committee, and through a focused briefing of the key points and implications. For the latter occasion, the plan's essence was reduced to one or two major points per strategy that were elaborated as interest grew.

The plan concluded with a review of existing and anticipated projects. For each project there was a discussion of the objectives, benefits, implementation plan and resources to be applied. The strategies developed in the remainder of the plan provided the infrastructure for the whole set of projects.

The planning process

The institution of a planning process is the single



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IN DEPTH/PLANNING AMID CHANGE

most important factor in managing the changes required in organizations as they seek to reap the benefits of ever-changing information technology. The Pfizer example outlines the distinction between creating a static "long-range plan" document and relying over a period of time on a documented planning process as an instrument of change.

For nearly two years, the Pfizer systems managers have used the document from the planning process as the agenda, working paper and minutes of their daylong monthly meetings. The document provides the systems managers with a framework for making decisions and a procedure for recording their assumptions, airing new issues and recording their priorities.

Over time, the focus of the plan has changed, corresponding to the progress toward the currently perceived vision. Early on, the emphasis was getting the hardware and software selections settled; now it is integration and telecommunications. Next, the emphasis will fall on reworking the data.

Of course, emphases overlap, and managers can be certain that that cycle will be repeated indefinitely. Already the subject of the first set of issues — personal computing — has resurfaced.

The benefits of being able to convey to user groups a self-consistent systems architecture have become clearly evident. One department that was willing to try out two office systems, and had come to prefer one over the other, gladly went along with the alternative system after seeing the greater benefits of linking to an overall systems architecture.

Another sizable group has given up its predilection toward a brand of incompatible personal computers. A corporate group has had little difficulty in departing from a once strongly held conviction against use

of a particular vendor's equipment in the face of a clearly worked out plan that made it the best choice.

After 12 months, the original management group repeated the planning process, including resecuring support from all the constituencies. A mere 68 issues, down from 75, surfaced this time. But, significantly, no discussion of format, audience or "why are we bothering" emerged — only a rapid re-execution of the essence of the process.

With so much resolved in the prior year, systems managers are able to appreciate new opportunities and two new strategies. The managers believe, at least for themselves, that they have defined a way of translating and combining a mixture of theoretical underpinnings, technological opportunities and a hazy vision into the process of managing change. ■

Installation strategies

HARDWARE. Install intermediate (departmental) computers between the corporate mainframe and personal computers.

SOFTWARE. Avoid development of new systems in procedural languages, such as Cobol or Fortran, in favor of fourth-generation languages.

DATA BASES. Construct business-specific data bases from corporate and external sources.

PERSONAL COMPUTING. Maintain a proactive attitude; centralize the purchase of approved hardware and supported software.

OFFICE TECHNOLOGY. Organize clustered hardware for secretaries; forge links from managers' personal computers.

ELECTRONIC MAIL. Take a proactive attitude; install systems as users fund them.

STAFFING. Maintain a balance of business/technology hybrids, supported by technology specialists.

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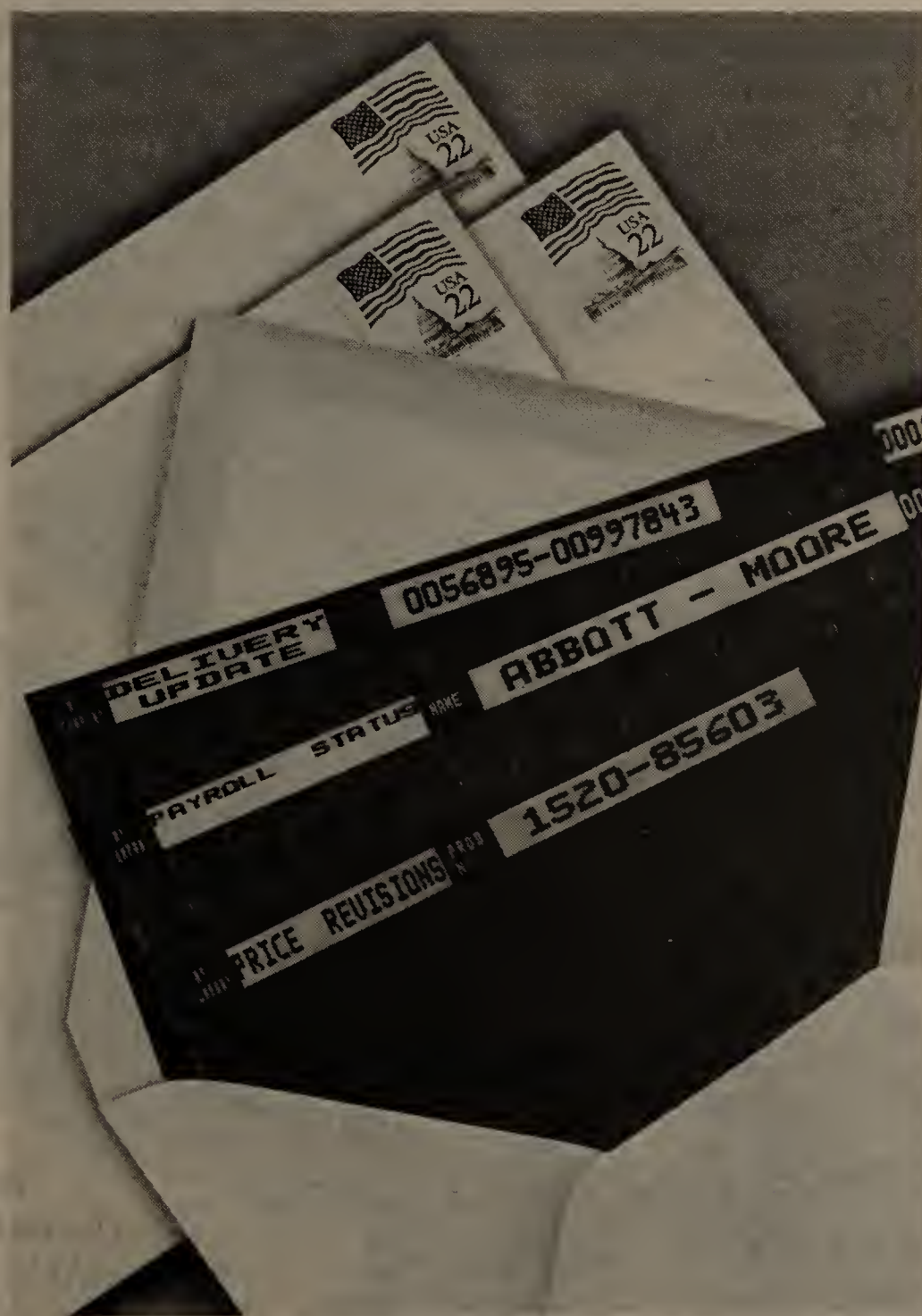
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IN DEPTH

Structured analysis can streamline software design

- More detailed specifications
- Errors more easily identified
- Specifications generated faster
- Higher quality documentation

By Louis Mazzucchelli

Manual methods help raise the average applications backlog to 30 work-months, so completed applications may no longer even match users' needs. Lately, traditional development tools are giving way to top-down software development methodologies that save time and reduce errors.

The software development industry hears grumbling on a regular basis. Conversations between software engineers, management and end users center on now-familiar themes:

- Software engineers do not have enough time to get applications written on time.
- Completed applications do not perform according to users' requirements.
- Development costs overrun budgets.
- Software engineers do not have the right tools.

These problems are typical of almost every software development effort, whether the development occurs in an MIS, DP or engineering environment and regardless of the size of the company and project.

Numerous software development methodologies are now available that support a top-down logical partitioning of system functions and data requirements. Because the analysis breaks system functions into distinct modules, management can more easily monitor and control the system's development process. Structured analysis, one of the most popular front-end techniques, contributes to the accurate and de-

tailed analysis of a system long before a line of code is written.

A prime example of a project bogging down in the development stage is the Reagan administration's Strategic Defense Initiative (SDI) antimissile defense system. According to a *Washington Post* report, SDI officials cite computer software as the biggest technical obstacle of the entire project. Many top software experts agree there is no conceivable way to write and test the software that would be needed to operate the defense hardware reliably. Close observers of SDI remain pessimistic about the software industry's ability to develop real solutions.

In general, the average application backlog nationwide approaches 30 work-months, according to some estimates. Many shops continue to rely on manual methods to develop systems, a technique that contributes heavily to the backlog.

Once an application finally gets into the development cycle, it often takes as long as two to three years to deliver. Moreover, a completed application often does not suit the end-user's needs simply because those needs have changed during the few years it took to develop the software.

Expensive mistakes

Furthermore, the manual approach leaves applications prone to costly errors. In a few cases, applications are so error ridden that exorbitant costs are incurred to rework and maintain the

Louis Mazzucchelli is chairman of Cadre Technologies, Inc. in Providence, R.I., manufacturers of workstation-based software development tools.

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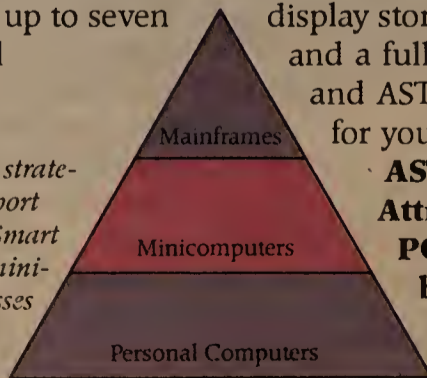
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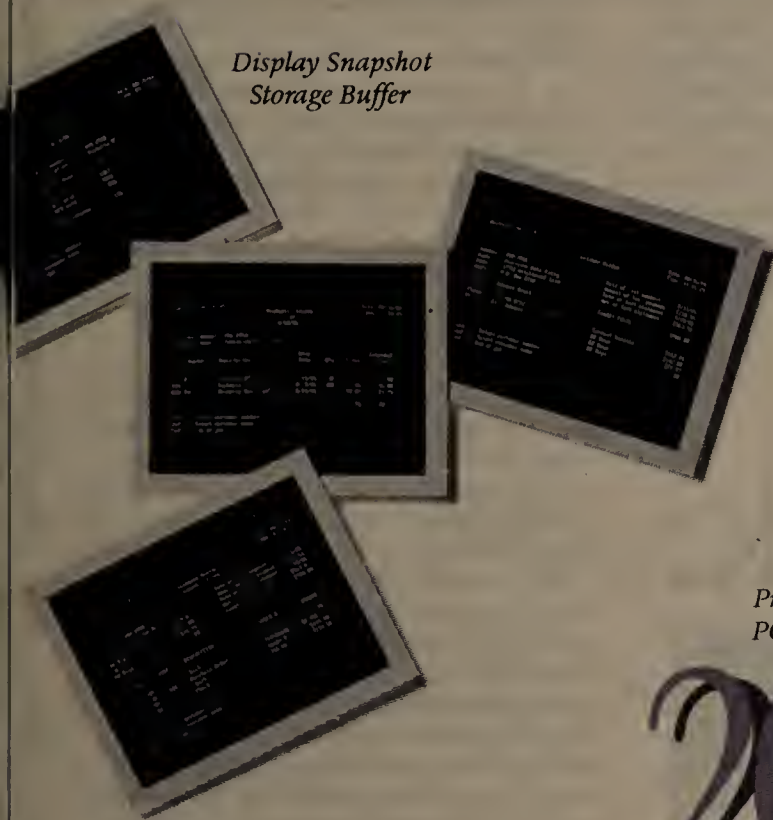
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IN DEPTH/STRUCTURED ANALYSIS

system — costs that continue throughout the life of the system.

Management continues to demand new applications to run its businesses, and as much as 80% of embedded system functions are software implementations. For the time being, software development teams will continue to feel pressured to produce software better and faster.

Structured analysis

To address these problems, the software industry initially developed programming tools, such as third-generation languages, on-line editors and text processors. When these tools reached the limits of their productivity gains, the industry turned its attention to the front end of development — systems analysis.

In structured analysis, the structured specification replaces the tra-

ditional voluminous textual specification and incorporates graphics and text into a clear, logical format. Structured analysis enables end users, managers and software engineers to understand and communicate system requirements clearly and to make changes to those requirements. The lengthy textual specification document is no longer needed.

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A majority of system errors are introduced during the analysis and design phases of development — at a point where errors are less expensive to correct. As high as 64% of system errors can be traced to the analysis and design phase.

Computer Sciences Corp. (CSC) conducted seven years of research on productivity and quality associated with the use of structured analysis and design techniques. According to Thomas Clark, director of product assurance, CSC's research shows that there has been a 10% compounded growth rate in productivity over the seven-year period. In addition to

productivity gains, there has been a shift in how software engineers spend time during the development phase.

Clark notes that before structured techniques were used, 30% of the development time was spent in analysis and design efforts, while 50% was spent on testing and debugging.

“With structured techniques in place, those figures have been reversed,” he says. “Now, 50% of the development time is spent on analysis and design, with 30% spent on testing and the remaining 20% on coding.”

The CSC research also indicates that analysts can accomplish more in the same amount of development time and that they produce higher quality work in the same period of time.

Clark explains, “With structured analysis and design techniques, very detailed and complete analysis and design phases occur, and analysts know when analysis is complete” — that is, when specifications represent the users' requirements, and the final lowest level logical processes of the system are described. This kind of detail yields a tenfold improvement in quality.

Structured analysis and design also improves the outcome of the testing and debugging phase. Engineers can now find errors early in the development process, so errors reach the test and debug phase less often; test engineers can spend their time more productively. By reducing errors up front, costs can be reduced in testing and contained during maintenance.

Awkward by hand

As much as they contribute to overall productivity and quality improvements, manual structured analysis techniques are still cumbersome. There is a need for yet more automation.

Done manually, specification documents usually are not fully developed to the most detailed level until after the system has gone through later phases of development. Specifications, sometimes done as an afterthought, are not checked thoroughly and therefore are inaccurate. Software engineers are reluctant to do complete specifications because they still have to redraw each project model diagram manually every time there is a revision.

Analysts working on the same project still must shuffle papers to see the entire project model. As a result, communication between team members remains poor, and errors continue to slip through analysis and design, although at a lower rate than before. Analysts simply do not have the time to check through piles of documentation for accuracy.

Software engineers are trained to be creative system designers, not draftsmen, and are extremely frustrated by the clerical functions they must perform. While contributing to better communication and organization, structured techniques — in and of themselves — do not solve the productivity/quality crisis.

The automation of the software development process has begun to address these problems during the last few years. Tools are now available to automate the job of software engineering.

A variety of tools can be chosen to address different development functions and contribute significantly

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to increased productivity and especially to quality. While programming tools are important during later stages of development, they will not contribute to overall quality if analysis is incorrect in the beginning.

Early error detection

The benefits of early error detection have become clear only recently. A majority of system errors are introduced during the analysis and design phases of development — at a point where errors are less expensive to correct. As high as 64% of system errors can be traced to the analysis and design phase, according to a TRW, Inc. study.

As errors move through the development cycle undetected, the cost to correct them increases up to multiples of 100 or more. It makes sense to do the programming task right the first time. Software development tools that automate the initial analysis phase will offer more benefits in the long run and will increase the quality of applications and the productivity of software engineers.

According to an International Data Corp. study, five types of automated tools are available to the systems analyst, each designed for the analysis phase of development:

- Stand-alone products for analysis, which may include the design phase. These products run on both personal and mainframe computers.

- Products developed to mechanize a software development life cycle methodology.

- Products that are developed to be incorporated into an in-house methodology.

- Products that are part of a software engineering workstation.

- Products that are part of a software development environment that run in a mainframe environment.

The functionality of automated software development tools is directly affected by the hardware platform upon which they are based. Therefore, the hardware decision is as important as deciding upon the automated tool itself.

Functionality debate

One of the major debates in the software development industry centers on which hardware platform will provide the most productivity functions and support to automated analysis tools. Personal computers, workstations and minicomputers with terminals represent the three most common hardware platforms for automated software development tools. A number of hardware considerations influence the performance and capabilities of the automated tools that run in each of these hardware environments.

Personal computers remain an inexpensive and popular system for business use. Personal computers present a viable platform for a software tool in companies with an installed base of personal computers and only a moderate budget.

However, one of the major problems with personal computer-based tools lies in their limited computing and memory capacities. Limited memory prohibits a thorough system analysis, constrains the project model complexity and hinders the in-depth analysis and validation required for true efficiency.

The lack of networking and multiprocessing capabilities also decreases the attractiveness of stand-alone, personal computer-based

tools. When many people, working on a project together, need to share vital project information, multiuser capabilities become critical.

One way to counter the problems with the personal computer environment is to add memory, peripherals, networking and other support that ultimately increase the hardware cost and make the system more technically cumbersome and difficult to maintain. This also increases the cost of the systems — possibly to the point where they are no longer economical for small companies.

The **minicomputer** with terminal hardware platform offers greater storage and computing power, which argues strongly in its favor. This hardware, however, typically cannot support a large number of interactive graphics users without investing in specialized terminals that ap-

proach the cost of low-end workstations.

One of the most promising hardware platforms for software development tools is the **workstation**. The workstation offers a high-quality combination of personal computer and minicomputer configuration benefits. Workstations provide quick processing speeds, extensive memory capacity and high-quality graphics.

Networking capabilities, such as those of the Apollo Computer, Inc. Domain systems, enhance communication between project team members and let systems analysts share the same project-model information data base, reducing the duplication of effort. Clark says, "The natural, informal communication processes break down when five or more analysts are working together, requiring a formal system for exchanging in-

formation. In addition, without a multiuser system, it is a pain to consolidate or reconcile data dictionaries across workstations."

Speed and processing capabilities also contribute to increased analyst productivity. Hardware running on the Motorola, Inc. 68020 processor provides the power required to check and verify detailed models quickly.

Although workstations are relatively new, industry analysts expect the workstation market to grow at a considerable rate and become pivotal to the software and hardware engineering environments.

Functions of automated tools

One of the first distinguishing characteristics of an automated tool is the scope of the tool. Many tools offer a wider range of functions and

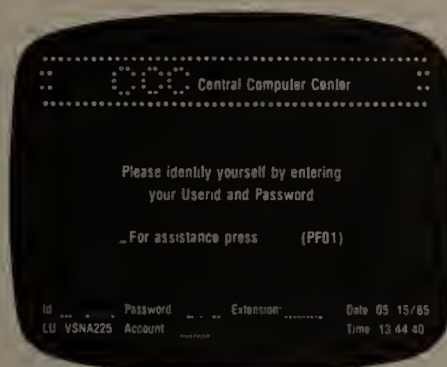
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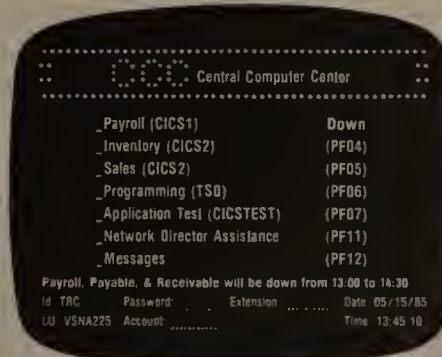
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claim to automate more of the development process. While on the surface this seems attractive, a broad-range system doesn't necessarily have the ability to provide in-depth capabilities. Tools that can go into greater depth and detail will provide better quality analysis and will have greater, more positive repercussions later in the development life cycle.

Ultimately, tools will automate more of the software development life cycle and simultaneously provide comprehensive in-depth analysis capabilities. However, most tools on the market today cannot perform both well.

Most tools are based on some kind of methodology. Some tools were developed in-house to support a company's development department, using proprietary methodologies. Other tools support one methodology exclusively. Therefore, users of automated tools may have to learn a new methodology or may be limited to the choice of tools that support their current approach.

Many tools claim to be "methodology independent," allowing the user to choose any method. Care should be taken in evaluating these tools, as this term is sometimes used to mask inadequacies.

The user interface is very important. Users should be able to see their accomplishments quickly. They should be able to add, revise and delete graphic and textual information rapidly and not have to "wait for the machine." Tools that support a pointing device, such as a mouse, enhance productivity by allowing rapid manipulation of model objects.

Graphics capabilities become critical to users developing data flow diagrams, structure charts or other diagrams. The better the graphics capabilities of the hardware platform, the more productive the user interface can be. Hardware that supports windowing capabilities, for example, enable the user to view many portions of the model at the same time and review, edit or correct work that has already been created — a great efficiency tool.

Users should be able to redraw diagrams quickly and automatically. The less time analysts spend drawing diagrams, the more productive their time will be. Some tools now enable users to identify groups of data flow diagrams and move them to a different part of the project model. For example, the software will copy, paste and regroup data flow diagrams into different configurations. This helps the analyst experiment with different model ideas.

Users should have access to data dictionaries from various parts of the project model. Some tools allow an analyst to access the data dictionary from each data flow diagram, enabling the user to access a definition quickly. Other tools require that users move out of one environment to get to the point where they can access the data dictionary. Integration between these model components proves extremely valuable.

Documentation support is another important feature of structured analysis tools. Documentation serves as the basis for communication between all the different players during the development life cycle.

Some available tools generate reports that incorporate text and graphics. The quality of documentation increases dramatically because engineers no longer must hand-draw

diagrams. The tool can print out project specifications neatly and in a logical order. Since end users are the ultimate recipients of such documents, a professional presentation can produce a positive effect on the relationship between users and developers.

Error checking

Checking for errors represents one of the most important features available from automated tools. Consistency checkers go through parts of a project model or the entire model and check consistency between data flow diagrams, data dictionary entries and process specifications.

Some error-checking tools print reports that show all places where consistency errors occur. This makes the job of searching for errors easy, saving considerable time and effort.

Automating error checking reduces the total number of errors simply because it does a complete and thorough check — one more comprehensive than any analyst would be willing or able to do manually.

Automated design tools not only improve analyst productivity but also provide management with measures to mark progress. Some tools offer project management functions that keep track of previous projects and provide a data base of information that helps the manager estimate the completion date of a project and calculate budget information.

There has been much discussion about when it is appropriate for a company to obtain software development tools. Many think that a company must be large and have an abundance of complicated software

Continued on page 86

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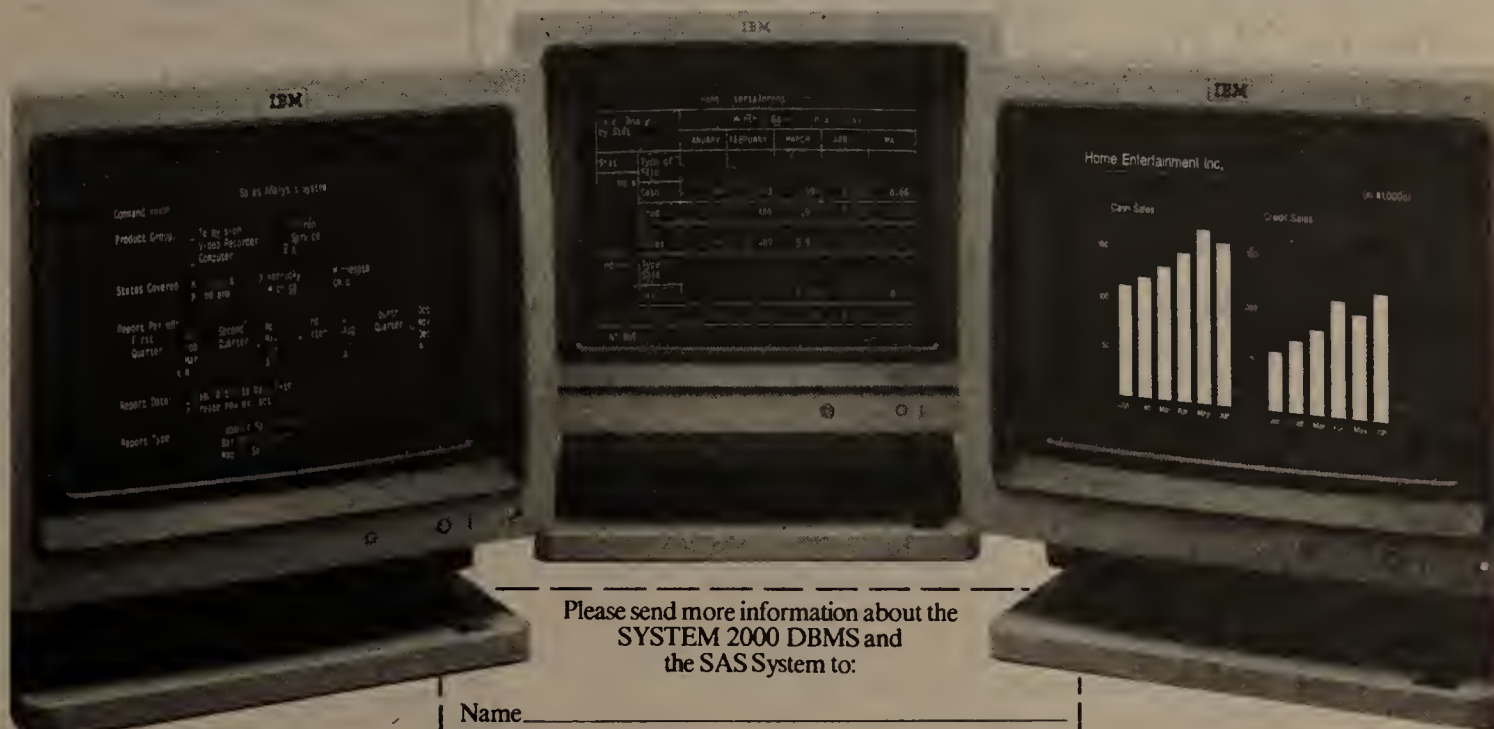
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A brief history of the software development industry

The software development industry's growth is often compared to the growth of the hardware industry. In hardware, technological achievements in development provide an impetus for rapid growth. This growth came after many years of hardware developers' experimentation with tools and techniques.

In the early days of hardware development, components were custom made, resulting in one-of-a-kind systems that were hard to mass-produce and very difficult to modify for different applications. Tools for building systems were primitive.

In the 1940s and 1950s, mathematician Alan Turing provided the computer industry with several invaluable concepts for developing computer systems. He proposed that hardware engineers use a set of only two or three basic principles to build machine language operating systems. These principles — sequence, selection and iteration — enforced a more logical approach to development and later became the fundamental building blocks of structured programming.

As commercial components have become available, the system building process has become less of a handcrafting operation. Automated tools such as oscilloscopes, logic analyzers and in-circuit emulators

have helped the electrical engineer in all areas from conceptual design to circuit design and debugging.

One of the most significant hardware development tools is the desktop computer-aided engineering (CAE) workstation. The CAE workstation provides the engineer with sophisticated graphics capabilities and encourages team development with networking, multiprocessing and interactive capabilities. Engineers now can test circuitry as it is being developed.

The software industry has been slow to reach this level of sophistication. In fact, many observers believe that the failure of software to match the pace of hardware innovation may have led to the current hardware industry slowdown. Software must catch up to provide fertile new applications areas and reinstate a pull for hardware.

During the 1960s, programming was unstructured and to a large extent unplanned. Programming focused on speed, and programs were composed of layer upon layer of code that only the program's creator was able to understand. Documentation consisted of source code listings and limited comments. Program maintenance was tedious, inefficient and, some claimed, virtually impossible.

In 1962, Corrado Bohm and Giuseppe Jacopini demonstrated mathematical proof of the validity of Turing's three principles. Bohm later suggested that a programming language need only contain Turing's basic concepts to be complete.

In the late 1960s, Edsger Dijkstra presented a paper during a conference on structured programming. Dijkstra came out in support of eliminating GOTO statements and favored the use of the same three principles Turing had introduced years before. With the emphasis on simple, easy-to-understand programming languages and with guidelines for programmers to follow, the structured programming movement grew at a rapid pace.

High-level programming languages such as Cobol and assembly were developed to help the programmer write simple and easy-to-maintain code. Third-generation languages, on-line editors and text formatters contributed to overall higher programmer performance.

These tools were useful but reached a ceiling in their impact on overall project productivity and quality. The bottom-up approach to development focused on the smallest aspects of the application's development — programming and code generation — and often result-

ed in a misunderstanding of the project's overall goals and the objectives of the system.

The software development industry recently has shifted to a top-down approach to development. The top-down approach focuses on the overall functions and objectives of the system rather than on lines of code and concentrates on basic design characteristics required by the user. This emphasis results in a more logical, segmented development process and provides the framework for many of the leading structured methodologies that are used today.

But most methodologies remain manual efforts. Recently, software development teams are moving software development methodologies to the workstation, following the CAE hardware development sector's lead. This provides an automated desktop solution to many of the software development industry's problems.

Graphics, windowing and multiuser support are critical functions that increase the capabilities of the software engineer. It is the combination of hardware support tools and structured methodologies that will ultimately increase the productivity and quality of software development efforts.

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PANASONIC				
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NORTH TELECOM				
NT6K90 Displayphone Plus.....	\$995	\$ 97	\$ 54	\$ 37

CITOH & CIE				
CIT220+ Video Terminal.....	\$775	\$ 75	\$ 42	\$ 28
CI300 Matrix Line Printer.....	4,045	388	216	146
CI3500 Serial Printer.....	1,145	110	62	42

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*Source: PC World and PC Week magazines, editors of seven U.S. and European trade journals.

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It simply works better.

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IN DEPTH/STRUCTURED ANALYSIS

Continued from page 83

development projects in the backlog. Actually, both large and small companies benefit from automated development tools. From engineering to MIS, almost all software development organizations can see productivity and quality increases from their staffs with the use of appropriate automated tools.

Even projects requiring only one analyst benefit from tools simply because models are then automated.

With automation, management and new analysts can access and trace model changes through the original specification, making the maintenance process easier.

As shown above, automated tools offer functions that contribute to overall productivity. Often the improved quality of the specifications produced more than make up for the cost of a development tool because they save so much coding and maintenance time.

As a rule, the more analysts there are working on a project, the longer the project development time and the more complex the system to be developed, the more a development team needs automated tools. Networking, automated drafting capability, consistency checking and error-checking functions can make the analyst's job easier and can provide the support needed to get the job done on time and on budget.

The immediate benefits of automated development tools are many:

- Detailed specifications contribute to higher quality design. Complete analysis models provide a guideline for the rest of the development process, making a positive impact on the rate and accuracy of design and implementation.

- Analysts can identify and eliminate errors more easily during the period of development when errors re-

main inexpensive to correct.

- Specifications are generated faster. Analysts, therefore, can take the time to conduct exploratory analysis, looking for better ways to design software systems.

- Automated tools boost the quality of the documentation, enhancing communication between end users, analysts and management. Basing decisions about a project's direction on an easily understood document eliminates misunderstandings, ensuring that the new system meets users' requirements.

Future tools

At this point, one can only estimate the long-term benefits of using automated software development tools, as the industry is still too new to provide conclusive statistics. However, initial studies indicate productivity increases up to 300% or more with the use of automated tools.

One can expect that automated tools will continue to develop for some time. Industry observers predict that most tool manufacturers will develop complete software development product lines to provide integrated tools that together encompass the entire software development life cycle. Automating the entire process with a single family of software development tools will not be uncommon.

Automated tools may also enable software engineers to conduct tests on a system early in the development process with a minimum amount of coding. This system simulation will help to determine the system's functionality and ensure that it will work according to the specifications.

The automated tools that are already available go a long way toward combating the illnesses of the software development industry. If the software industry does not make the effort to automate itself more fully, productivity and quality will remain low. Management, however, first must begin making the necessary commitments to automated tools. ■



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NEW PRODUCTS



DEC's VAX Engineering Data Control System operates in CAD/CAM environments.

DEC unwraps data manager

Digital Equipment Corp. of Maynard, Mass., has introduced an engineering data management system for computer-integrated manufacturing.

The VAX Engineering Data Control System (VAX EDCS) uses various hardware, data base management software and communications protocols to manage computer-aided design and manufacturing data, drawings and engineering documents.

The system functions as a department or project data manager in a CAD/CAM environment. It also manages noncomputer-related documents. It maintains CAD/CAM engineering data in a central, common data base designed to function like an on-line library. Data is stored, archived, retrieved and protected in the common library.

VAX EDCS uses the DEC VMS operating system, VAX RDB/VMS relational data base, local and wide-area Decnet networking products and the appropriate disk and tape units. The features it provides include engineering change order control to files; change history and audit trail; and automatic notification of changes in file status using electronic mail.

A complete entry-level system is priced from \$105,000 and includes a DEC Microvax II computer with 9M bytes of memory, 426M bytes of disk storage, a 1,600 bit/in. magnetic tape drive and the necessary software licenses. The top-of-the-line system includes a DEC VAX 8600 processor and is priced at about \$650,000. The VAX EDCS software is available separately at prices ranging from \$12,000 to \$30,000.

Easel graphics expanded

Interactive Images adds modules for IBM micros

Interactive Images, Inc. of Woburn, Mass., has unveiled three modules for its Easel graphics interface software for the IBM Personal Computer and compatible systems. The Easel system takes information that comes down from the mainframe and turns the mainframe syntax into icons or graphics.

Easel, which costs \$6,500, runs on the IBM Personal Computer, AT and XT and compatibles. The system requires either an IBM Color Graphics Adapter, Enhanced Graphics Adapter or a Tecmar, Inc. graphics board. The package replaces monochrome characters with color icons, windows and graphs.

The 3270 Support module, which costs

\$3,900, allows programmers to access formatted and unformatted applications to create graphics interfaces. The module is said to enable programmers to put a graphics user interface front end on application environments.

The Easel/Layout module costs \$2,500. It allows developers to create, add and modify icons, keys and regions. A pull-down menu gives a choice of standard patterns, shapes and attributes of the shapes. When the developer is satisfied with the created object — color, pattern, location, size, opacity and scale — Easel generates the code necessary to integrate the desired object or screen into the Easel front end.

An Automated Business Graphics module allows users to input data and select graph types from nine different graph options.

The Automated Business Graphics module costs \$500.

Multimate ups word processor

Multimate International Corp. of East Hartford, Conn., has updated its Multimate Advantage Professional Word Processor to include columnar operations and a built-in thesaurus.

Version 3.6 supports up to eight columns on a page. Users can set column width and tabs for each column as well as the spacing between columns. The new version also supports winding text and logically associated columns as well as all editing functions in the column mode.

A 40,000-word thesaurus, developed by Proximity Devices, Inc. of Fort Lauderdale, Fla., provides definitions as well as alternate words and phrases for highlighted text without requiring the user to exit from the document.

Version 3.6 also offers a typewriter mode that allows users to create and print text by character or by line from the Print Control Utilities menu, and it provides a keyboard merge that allows users to insert variable information into a document without creating a secondary document.

Multimate Advantage 3.6 is priced at \$595. Users who purchase Multimate Advantage 3.5 after Dec. 1 can upgrade to Version 3.6 free of charge. Existing advantage users can update to Version 3.6 for \$60.

Dbase software debuts from Ashton-Tate

Ashton-Tate of Culver City, Calif., has introduced the Dbase Ctools series for Dbase III Plus.

The series is composed of two add-in software packages designed to help programmers develop applications. Dbase Ctools allow users to add functions, commands and programs written in the C language to Dbase III Plus applications. The two packages are The Programmer's Library and The Graphics Library. They include built-in C functions and a basic engine for adding the functions to Dbase III Plus applications.

The Programmer's Library provides more than 25 financial, mathematical and statistical functions.

The Graphics Library provides functions that enable programmers to create customized graphs. It includes several business graphics for use with a monochrome monitor, including bar graphs, pie charts and line charts.

The Programmers Library, available in January, and The Graphics Library, available in February, will be priced at \$89.95 each.

INSIDE

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Ciperlink introduces data translating software package

Software links incompatible systems

Cipherlink Corp. of Los Angeles has introduced a software package to translate data for exchange between incompatible computers. The Calculations Peripheral package is said to be the first in a series of enhancement packages for the company's Any data bridge software utility.

The 2-year-old company developed a line of products that bridges

incompatible computer systems, a spokeswoman said. The products do this by capturing screen images, automatically changing data that needs to be changed before it can be entered onto another system and re-keying the data to the new system.

Calculations Peripheral costs \$1,500. It is used with the \$10,000 Any bridge, which can transfer data residing on any operating system to any other operating system, a spokesman said. Both packages are written in C and may reside on IBM PC-DOS or AT&T Unix-based com-

puters. The Any software resides on an independent computer connected to the source and target computers through a terminal port.

The Any package extracts a desired data field from a source application, transfers it to an intermediate data base and then automatically re-keys the data into the appropriate field in the target application.

Calculations Peripheral ensures that the data in transit conforms to requirements of the target application. While the data is stored in the intermediate data base, Calculations

Peripheral allows the user to manipulate specific data fields before data is transferred to the target application.

Mathematical functions as well as table lookups can be performed on the extracted source data, and a data field can be accumulated so that the total amount can be transferred to the target system.

Examples of use include the translation of currency exchange computations so that prices stored on a computer overseas can be translated for use by a computer in the U.S.

NEW PRODUCTS/SOFTWARE & SERVICES

SOFTWARE

Systems software

CGA Software Products Group, Inc. has released **Version 4** of its **Top Secret** security software package.

Version 4 comes with rewritten documentation. Other features include use of the extended memory addressing of the IBM MVS/XA operating system; TSS Chart, which provides a diagram of the organization and structure of the security data base; the ability to associate profiles with a given user; and a provision for different time zones in constructing user profiles.

Version 4 of Top Secret for MVS costs \$11,500 for an annual license.

CGA Software, 960 Holmdel Road, Holmdel, N.J. 07733.

S&H Computer Systems, Inc. has introduced **TSX-Plus Version 6**, a multiuser operating system designed to support windowing between concurrent processes on the Digital Equipment Corp. PDP-11 and Professional 300 series computers.

Version 6 supports up to 40 users on the PDP-11 and up to five on the Professional. It offers enhanced password protection and support for special functions keys on VT100 and VT200 series terminals.

Using the Process Windowing feature, up to 10 tasks can be controlled from a single terminal.

TSX-Plus Version 6 is priced at \$2,000 on the PDP-11 and \$900 on the Professional 300 series. Annual fees for support and updates are \$500 and \$300, respectively.

S&H Computer Systems, 1027 17th Ave. S., Nashville, Tenn. 37212.

Charles River Data Systems, Inc. has released **Revision 6** of its **Unos** operating system.

The new version enables users of the company's Universe computers to upgrade to the Motorola, Inc. MC68020 microprocessor, and it supports I/O processors. It provides distributed processing capabilities for the International Standards Organization/General Motors Corp. Manufacturing Automation Protocol and Boeing Computer Services Co.'s Technical Office Protocol multivendor environments.

Other features include support of a 140M-byte Winchester disk.

Unos is compatible with AT&T Unix.

Unos Revision 6 costs \$3,000.

Charles River Data Systems, 983 Concord St., Framingham, Mass. 01701.

Professional Computer Resources, Inc. has released **Version 6** of its **Resource Management System, RMS/38**, for manufacturing and distribution operations designed for the IBM System/38.

Version 6 includes a new general ledger and financial reporting system, a new purchasing system and a system for physical inventory and cycle counting, which has been added to the inventory control function. A menu master has also been added as well as an integrated system that supports features and options through bills of materials and order processing.

RMS/38 is priced at \$125,000.

Professional Computer Resources, 2 Mid America Plaza, Oakbrook Terrace, Ill. 60181.

Software International Corp. has announced a new version of its **Payroll/Personnel** system for the Wang Laboratories, Inc. VS computer.

The product incorporates advanced on-line file maintenance processing and immediate update to the Software International general ledger and financial reporting system.

The newest release includes expanded amount fields and account fields, expanded deduction capability and flexibility, 401K-byte reporting, interactive processing, return-code checking and separation of edit and update jobs.

The product, including documentation, is available for a license fee ranging from \$18,000 to \$33,500, depending on the configuration.

Software International, 1 Tech Drive, Andover, Mass. 01810.

Dynamic Products has announced **Automated Time Initiated Sign-Off (ATIS)**, designed to enhance CICS security by providing automatic time initiated terminal sign-off.

If no activity takes place at a terminal within a specified amount of time, the terminal signs off. The amount of time can vary for each terminal in the CICS system. At specified intervals, all terminals in the system are scanned to determine whether anyone has been inactive for the specified amount of time.

ATIS rents for \$80 per month, \$800 per year or costs \$2,400 for a permanent license.

Dynamic Products, 1782 Richard Circle, St. Paul, Minn. 55118.

Waters Business Systems, Inc. announced the **WBS Mail2 Mail List Management System** for the IBM System/34 and 36 and System 36/PC.

The WBS Mail2 provides name, address and telephone information plus fields for source, industry, territory or region and 12 other user-definable codes. It features screen and menus with on-line documentation. The system output capabilities include a variety of statistical reports, multiple mailing label formats, Rolodex cards and a merge file that interfaces with many word processor programs.

The WBS Mail2 Mail List Management System is priced at \$200 for object code and \$600 for both object and source code.

Waters Business Systems, 47 New York Ave., Framingham, Mass. 01701.

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A network should be looked at not simply as a communications tool, but as a business asset. Like any other asset your business holds, it too can be controlled and managed and made to work for you.

All our networks let you incorporate new applications, making your system more powerful than ever. And thanks to our integrated digital T-carrier interface, you can speed up and control the flow of not only voice, but data transmissions as well.

In a small area, like a campus, or

even nationwide, look into our Distributed Communications System. With it, multiple systems serving up to 100,000 lines can function as one. It also offers extensive voice and data terminal transparency and attendant transparency, so attendants can control the entire system from one location.

Remote Groups let you extend System 85 capabilities to small locations via DS-1 facilities. Remote Modules serve larger locations, up to 2½ miles away, over fiber optics. Voice communications and data from host computers are transmitted with complete user transparency.

An Electronic Tandem Network can also be used to link locations anywhere in the country. Through a mix of analog, high-capacity digital, and public facilities, virtually any number of voice and data terminals can be connected.

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Once you've linked your communications into one network, you'll have a host of powerful features working to increase productivity, reduce costs and give you more control over your communications. Automatic Route Selection, Automatic Alternate Routing, and Queuing choose the least expensive path for all network calls. And "Authorization Codes" grant calling privileges to appropriate employees.

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There are over 350 ETN's and DCS's already in place. More than half of the *Fortune 500* companies have chosen private networks from AT&T Information Systems. Besides our features, function and investment protection, there's one more compelling reason why—our service.

Our systems are backed by the largest sales and service staff in the industry. Network support includes predesign, cutover coordination, post-cutover administration, and ongoing maintenance. Add to that a century of communications experience and leadership, and your decision is easy. Of all your alternatives, only one is the right choice—AT&T.

To find out more about the Networking capabilities of System 85 and System 75, call your AT&T Information Systems Account Executive or 1-800-247-1212.



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NEW PRODUCTS/SOFTWARE & SERVICES

Shop Floor Control (SFC), a manufacturing package for the Wang Laboratories, Inc. VS written in Cobol, has debuted from MCBA, Inc.

SFC controls the flow of work on the shop floor by keeping track of materials, operations, personnel, machines and tools.

Functions include an ability to copy production shop orders from base shop orders; forward, backward or manual scheduling; support

for a shop packet, which provides manufacturing directions; and the ability to print a dispatch list of each work center's jobs.

Prices range from \$4,500 to \$7,000.

MCBA, 2441 Honolulu Ave., Montrose, Calif. 91020.

Expert Systems International has released **Version 2** of its expert systems development shell, **ESP Advisor**,

which is written in Prolog 2.

Version 2 allows users to construct knowledge bases of up to approximately 3,000 rules. Features include the ability to invoke programs written in Prolog during consultations using an optional Prolog 2 interpreter, a virtual knowledge base, the ability to reference parameters from within any text item displayed and an on-line Help facility.

ESP Advisor Version 2 is priced at \$895.

Expert Systems International, P.O. Box 53678, William Penn Station, Philadelphia, Pa. 19105.

System/38 Security and Burroughs Security Module, security packages for IBM System/38 and Burroughs Corp. computers, have debuted from **Lawson Associates, Inc.**

System/38 Security provides controlled access to fi-

nancial information on the IBM System/38. The system provides security down to the program, screen and function levels.

The Burroughs Security Module secures screens within applications or specific functions within programs on Burroughs computers, allowing managers to decide which users can access specific data base information.

Prices are \$4,000 for System/38 Security and between \$5,000 and \$10,000 for Burroughs Security Module.

Lawson Associates, 2021 E. Hennepin Ave., Minneapolis, Minn. 55413.

Versatec, Inc. has enhanced its **Expert PCB Designer** software, part of the Expert Designer series of computer-aided design and engineering systems that run on the Xerox Corp. 8014 workstation.

This release allows users to place parts interactively through dynamic dragging, rotation and rubber-banding of nets. A capability for displaying channel densities shows how many traces run through a given area.

Tools for automated printed-circuit board manufacturing include a method for creating optimal drill paths.

Expert workstations are available in a number of configurations ranging in price from \$40,000 to \$60,000.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

McDonnell Douglas Architectural, Engineering and Construction Systems Co. has upgraded **Moss**, its surface modeling system for civil engineers.

A module, **Interactive Moss**, is now included in the standard package to provide interactive design, editing and drawing capabilities.

With this enhancement, users can modify designs and remove errors automatically. The package accepts changes as updates to the model data base, the vendor said.

Moss, with the enhancement, is priced from \$35,000.

McDonnell Douglas Architectural, Engineering and Construction Systems, P.O. Box 516, St. Louis, Mo. 63166.

Plexus Computers, Inc. is distributing four AT&T Unix software development packages for its computer systems: **Philon, Inc.'s Fast/Cobol** compiler and **Fast/Basic-M** compiler; **Third Eye Software's CDB** source code debugger; and **Silicon Valley Software's SVS Fortran 77** compiler.

Fast/Cobol is compatible

Continued on page 95

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(PC Products, September 1985)

"The great thing about Enable is that it gives you all the benefits of a collection of top-notch stand-alone packages—plus integration to boot. It's what Symphony was supposed to be."
(Software News, January, 1985)

"Enable...may be the first program to make you give up your dog-eared WordStar, dBASE II, Smartcom and Lotus 1-2-3 disks."
(Business Software, April, 1985)

"Each of the five modules in Version 1.1...has a depth of features and functionality rare in an integrated package..."
(InfoWorld, November 18, 1985)



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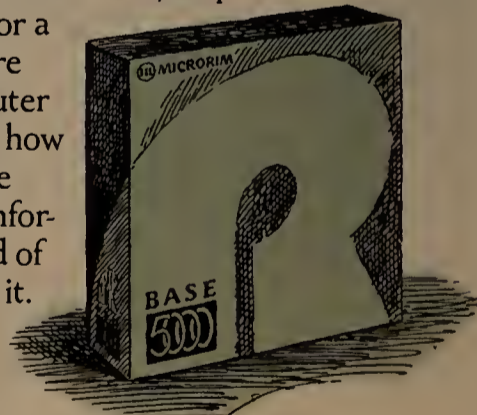
Datapro Research Corporation to rate our single-user version as the best DBMS on the market. But we've also designed it to make optimum use of all the extra capabilities offered by the IBM PC Network (IBM PC DOS 3.1). To optimize data sharing, R:base 5000 Multi-User takes full advantage of the front end processing power of the PC. As a result, multiple users will be able to work with the same database at the same time.

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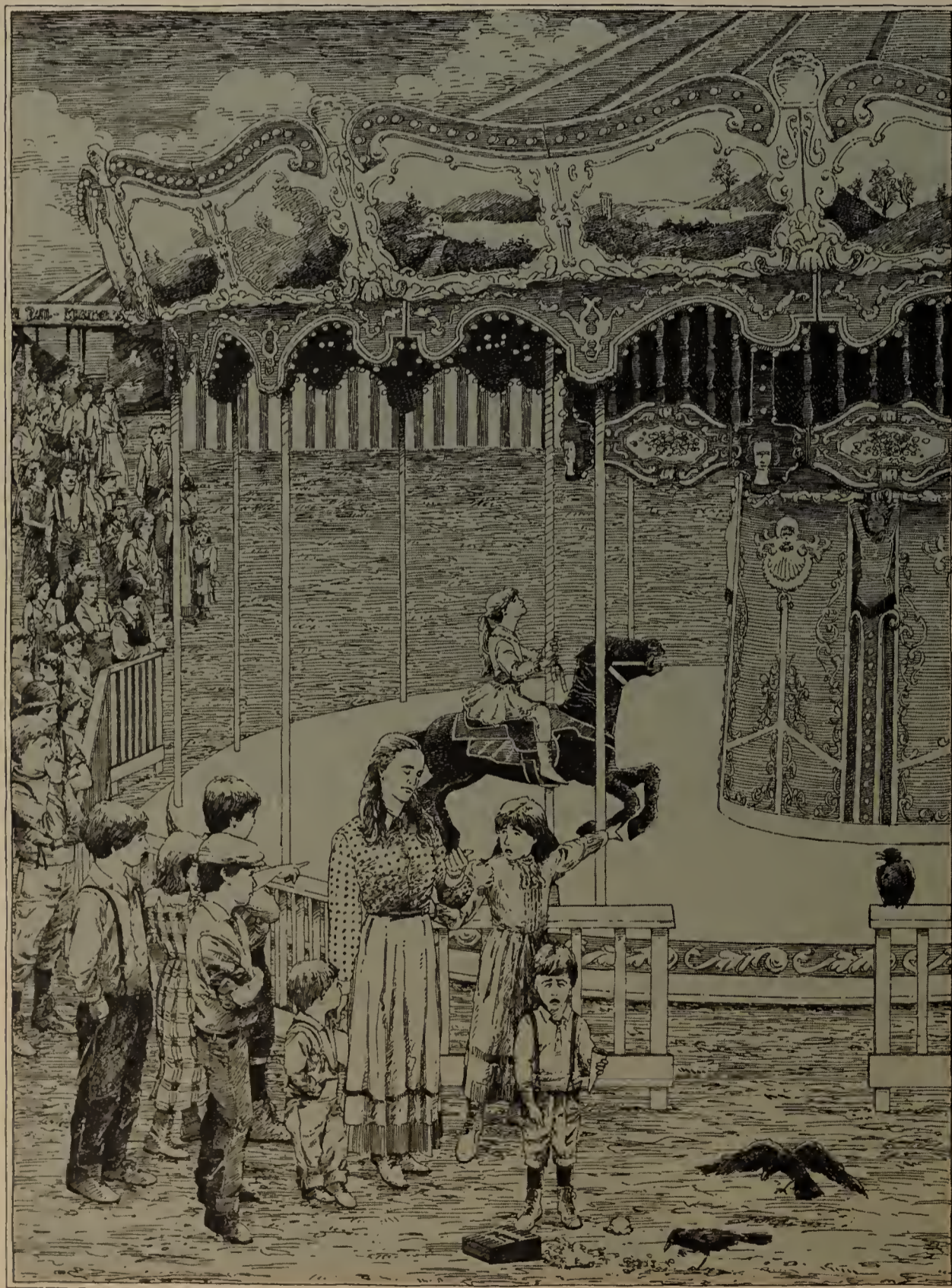
Just call 1-800-547-4000 and ask for Dept. 867. From Oregon, or outside the U.S., call 1-503-684-3000, Dept. 867. Or head straight for a leading software store or computer dealer. And see how nice it is to take advantage of information. Instead of taking turns at it.



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COMMON SENSE IN DATABASE MANAGEMENT
NUMBER FIVE IN A SERIES.

NEW PRODUCTS/SOFTWARE & SERVICES

Continued from page 92

with Ryan-McFarland Corp.'s RM/Cobol. It is General Services Administration certified and conforms to ANSI 74 standards.

Fast/Basic-M is Microsoft Corp. Basic compatible. It lets users write Unix applications code without needing to learn a new language.

CDB complements Unix's built-in C compiler and is Unix System V compatible. It allows programmers to locate and fix bugs in the context in which they were created, according to the vendor.

SVS Fortran 77 helps users convert programs written in Fortran 66 dialects to Fortran 77.

Prices are \$2,200 for Fast/Cobol development and runtime versions; \$600 for Fast/Basic-M; \$950 for CDB on the Motorola, Inc. MC68010-based P/15 and P/20 multiuser computers and \$1,200 on the 16-user P/35 and 40-user P/60; and \$800 for Fortran 77 on the P/15 and P/20 and \$1,200 on the P/35 and P/60.

Plexus Computers, 3833 N. First St., San Jose, Calif. 95134.

Productivity aids

Extended Applications, Inc. has announced **ABC**, an application generating system for creating business-oriented programs and their source code.

ABC is available for Digital Equipment Corp. VAX/VMS, S & H Computer Systems TSX-Plus, Microsoft Corp. Xenix and MS-DOS, AT&T Unix and IBM PC-DOS operating environments. It can generate programs that include data entry, report, sort, transaction processing, graphics, file reorganization and menu. It also provides a standardized source code for each application generated.

Prices for ABC range from \$995 to \$5,500, depending on the operating system and language.

Extended Application, Building One, 410 Rouser Road, Coraopolis, Pa. 15108.

Application packages

Britz Publishing, Inc. has announced **Deskset/34/36**, a combination of five desk accessories for IBM System/34 and 36 users.

The Deskset/34/36 package includes a full-function desk calculator with rolling tape display, seven decimal modes, memory and a print option, a daily appointment calendar, a monthly calendar, a notepad and a card file including an on-line phone directory, the ability to print labels and an option for printing continuous Rolodex-type cards.

All accessories feature Prompt and Help screens. The package includes all source codes and a user's guide.

Deskset/34/36 costs \$99.

Britz Publishing, 1814 Capital Towers, Jackson, Miss. 39201.

DCS, Inc. has announced **CMS Commercial Mortgage Servicing** software for the IBM System/38.

The software, developed in cooperation with Southmark Corp., offers on-line, real-time flexibility and data base design, including externally defined files and print files. All screens offer the use of IBM's Help Text.

The system costs \$45,000, including source code and documentation.

DCS, Suite 317, 2880 LBJ Freeway, Dallas, Texas 75234.

Michaels, Ross & Cole Ltd. has announced the **RPG** option to its **MRC-Reporter** report writing module for the IBM System/38.

The RPG option allows users to generate free-form externally described printer files.

MRC-Reporter includes built-in sum and average functions and allows users to define new calculated fields based on the results of sums or averages.

The option allows users to print data base information from up to eight files.

Features include Help key documentation, multilevel security, multi-file reports and relational file joining.

The RPG option license fee for MRC-Reporter users is \$1,100.

Michaels, Ross & Cole, P.O. Box 4533, Oak Brook, Ill. 60521.

Gary Brown Associates, Inc. has announced the latest version of its **Fixed Assets Management System/On-Line (FAMS/OL)** for the IBM System/38.

New features include five-digit company number, division number, user-defined major control level, user-defined intermediate control level and user-defined minor control level.

Other features include the ability to accommodate \$999,999,999.99 in assets, multiple in-service dates, the ability to suppress detail on all reports, the ability to print 50 characters of description on all reports, extensive help text and more.

The price of the product is said to be \$6,800.

Gary Brown Associates, 322B Edwardia Drive, Greensboro, N.C. 27409.

Michaels, Ross & Cole Ltd. has released **MRC-Reporter Version 7**, its report writing module for the IBM System/38.

Version 7 provides data masking, a capability said to allow users to access significant digit number systems based on subfields buried within a larger field.

In addition, the vendor's CPF Release 7 data base architecture was included in MRC-Reporter to permit simple reports to share existing access paths.

Release 7 of MRC-Reporter also offers a more intelligent communications format that provides messages to keep users informed of their progress throughout the session.

MRC-Reporter licenses for \$2,240 per site CPU.

Michaels, Ross & Cole, P.O. Box 4533, Oak Brook, Ill. 60521.

Can you picture a local voice/data network that is powerful, practical and priced right...even for very small groups of users? It's real. And we've installed more than 40,000 channels.



That's right. At Telone, we've been showing companies large and small how to manage growing voice and data networks for years, and "cost-effective" is our middle name. Right now, for example, our Data Carrier Systems are helping more than 500 companies extend the useful lives of their telephone systems by letting them double as local data networks. For as little as \$450 per channel, DCS enables users to route synchronous/asynchronous data, at up to 9600 bps, to virtually any existing telephone jack. This makes adding or moving a terminal as easy as plugging in a phone—no modems, no cable, and no disruption of voice traffic at any time. We also offer a



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Simultaneous Voice and Data Transmission

full line of high-performance multiplexers and other networking products, but most of all

we provide expertise. When you do business with Telone, you deal with our own applications experts—people who know

networking inside out, and share your concern about controlling costs. If this sounds like a good idea to you, let's talk. We have

offices nationwide, and we'd welcome a chance to communicate with you.

TELONE®

Free Christmas pies in every box.

Put in your thumb and pull out a plum.
Namely, Boardroom Graphics.[®]

From now 'til Christmas*, you'll find a free copy of this highly-acclaimed business graphics program in every specially-marked box of Dysan[®] DS/DD diskettes.

Boardroom Graphics lets you turn data from your spreadsheets and other databases into 3-D graphics. Line charts. Scattergrams. Bar graphs. Cluster bars. And, of course, pie charts.

Just boot it up on your IBM[®] PC, XT or compatible.** Follow the

easy-to-use menus. You'll be cooking up tasty presentations in no time.

To get the free software, of course, we do ask that you buy the Dysan diskettes. After all, what better place to store your Christmas pies?

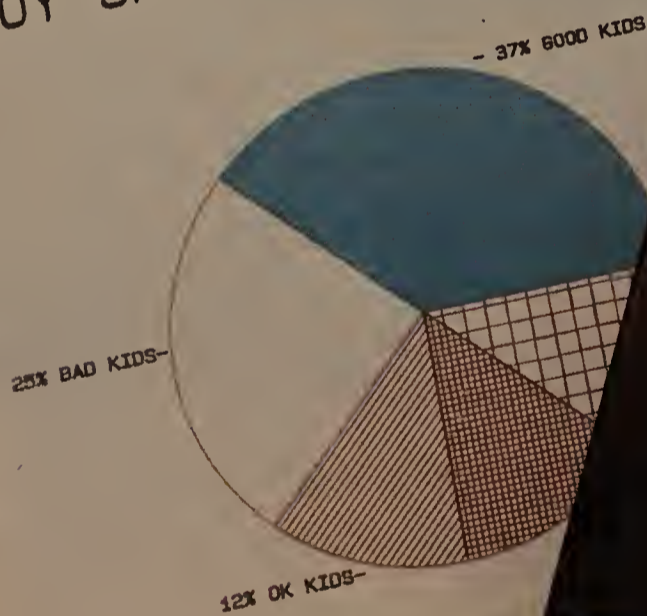
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than everybody else.

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14% TRUCKS

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*Quantities are limited. **Requires appropriate hardware. Dysan is a registered trademark of International Business Machines Corp. Boardroom Graphics, © 1984, Mark Haley. © 1985, XZY Corp.

NEW PRODUCTS/SOFTWARE & SERVICES

VIA Systems, Inc. is offering **Buildingblocks**, an application-specific integrated circuit design package for its VIA Worksystem.

It is a hierarchical automatic placement and routing package for very large-scale integrated circuit layout that uses a library of predefined functional blocks ranging from a single transistor to a complete microprocessor. Library blocks can be shaped irregularly and drawn manually or automatically.

Buildingblocks combines chip-level placement, routing, editing and analysis with cell-level physical design and editing on one workstation.

Buildingblocks, including Blocks placement and routing software, Blocks placement editor, hierarchical placement and routing package, costs \$55,000.

VIA Systems, 76 Treble Cove Road, North Billerica, Mass. 01862.

Data base management systems

Data Language Corp. has announced that its **Progress** data base and application development system is now available on multiuser microcomputers and minicomputers from AT&T, Altos Computer Systems, Inc., Motorola, Inc., Plexus Computers, Inc. and Sun Microsystems, Inc.

Progress is available on the Sun Microsystems Sun 2 workstation, the Motorola VME 121 process control microcomputer, the Plexus P-15 and P-20 multiuser microcomputers, the Altos 2086 system and the AT&T 3B5 minicomputer.

Pricing for the full progress data base and application development system ranges from \$3,450 for the Sun 2 to \$4,450 for the AT&T 3B5.

Data Language, 47 Manning Road, Billerica, Mass. 01821.

Training

General Electric Information Services Co. has announced **GETutor**, a computer-based training system that operates on GE's worldwide teleprocessing service.

There are 46 courses available on **GETutor**. Topics include data communications, IBM, data base management systems, programming languages, application tools and operating systems. **GETutor** is accessible to anyone who operates an IBM 3270 full screen-type terminal.

Prices, based on one student per course, range from \$50 to \$650. Student materials and communications access service charges are not included.

GE Information Services, 401 N. Washington St., Rockville, Md. 20850.

Goal Systems International, Inc. has released **Version 5.1** of its **Phoenix** system, a computer-based training system for IBM mainframes and plug-compatible systems.

Phoenix 5.1 allows users to broadcast immediate or delayed messages and notes. Other features include additional computer-assisted instruction/computer-managed instruction link options, a program function key user sign-on and the ability to

download simulation items onto personal computers.

The full **Phoenix** system is available for a permanent license fee of \$42,000 or a three-year renewable license fee of \$1,050 per month.

Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

Specialized Systems Consultants, Inc. has announced **Dial-A-Guru**, a telephone

consulting service for AT&T Unix, Microsoft Corp. Xenix and C language users.

Dial-A-Guru provides users with a consultant available by phone during working hours. The consultant is guaranteed to answer all questions concerning Unix, Xenix and C.

Dial-A-Guru is available for a monthly fee ranging from \$75 to \$195, depending on the number of calls made and the amount of time involved. If questions are not

answered, there is no charge for the time.

Specialized Systems Consultants, P.O. Box 55549, Seattle, Wash. 98155.

Science Research Associates, Inc., a subsidiary of IBM, has announced **3090 Hardware Operator Training**, an interactive self-study operator training course for the IBM 3090 system.

Continued on page 98

XEROX

Xerox
is about
to move
xerography
light years
ahead.

NEW PRODUCTS/SOFTWARE & SERVICES

Continued from page 97

The computer-based training course comprises menu-driven and student-controlled exercises, drill and practice problems and simulations of the operations of the 3090 mainframe system.

The course operates on an IBM Personal Computer. Simulation drills provided include controlling and invoking the remote support facility and invoking the system activity display frames.

The 3090 Hardware Operator Training is priced at \$700 for a 12-month lease and \$315 for a 12-month renewal, the vendor said.

Science Research Associates, 155 N. Wacker Drive, Chicago, Ill. 60606.

Command Computer Corp. has announced **Micro-Match**, a service that provides interfaces between micros and peripherals.

The service consists of two reference volumes of diagrams and instructions for interconnecting microcomputers to printers, CRTs terminals, modems and plotters.

Two versions of Micro-Match are available. An all-vendor version provides interfaces for major micros and peripherals. A single-vendor version consists of a series of volumes by manufacturer containing interfaces between the specific vendor's equipment and other suppliers' products.

Prices are \$690 per year for a subscription to the all-vendor version and between \$29 and \$149 for individual single-vendor volumes.

Command Computer, 36 Columbia Terr., Weehawken, N.J. 07087.

MICROS**Software**

Acme Computer Co. has announced **Linear Optimizer**, a software package for general linear programming on personal computers running Digital Research, Inc.'s CP/M or Microsoft Corp.'s MS-DOS.

The Linear Optimizer package consists of an integrated matrix generator, solution procedure and report writer. The generator accepts a formula-oriented matrix-generation language that features read and write statements and subscripted variables and constraints.

The package costs \$400.

Acme Computer, P.O. Box 51193, Seattle, Wash. 98115.

time processing monitor that executes CICS programs. It allows users to port command-level programs to a stand-alone micro environment without rewriting code.

MicroVSAM allows Cobol programs using mainframe VSAM to execute on the XT/370 microcomputers. It supports sequential, indexed and relative VSAM files and I/O, random- and dynamic-access modes.

MicroCICS/RT costs \$1,495, and MicroVSAM

costs \$495.

Unicorn Systems, 3807 Wilshire Blvd., Los Angeles, Calif. 90010.

TCI Software Research, Inc. has announced **Version 2.1** of its **T³ Scientific Word Processing System** for the IBM Personal Computer family, the AT&T PC 6300 and the NEC Corp. APC III.

T³ now supports more than 20 printers ranging

from dot matrix printers to daisywheel and thimble printers to laser printers including the Hewlett-Packard Co. Laserjet and the Laserjet Plus, the Xerox Corp. 4045 and 2700 and the Quality Micro Systems, Inc. Lasergraphix series, according to the vendor.

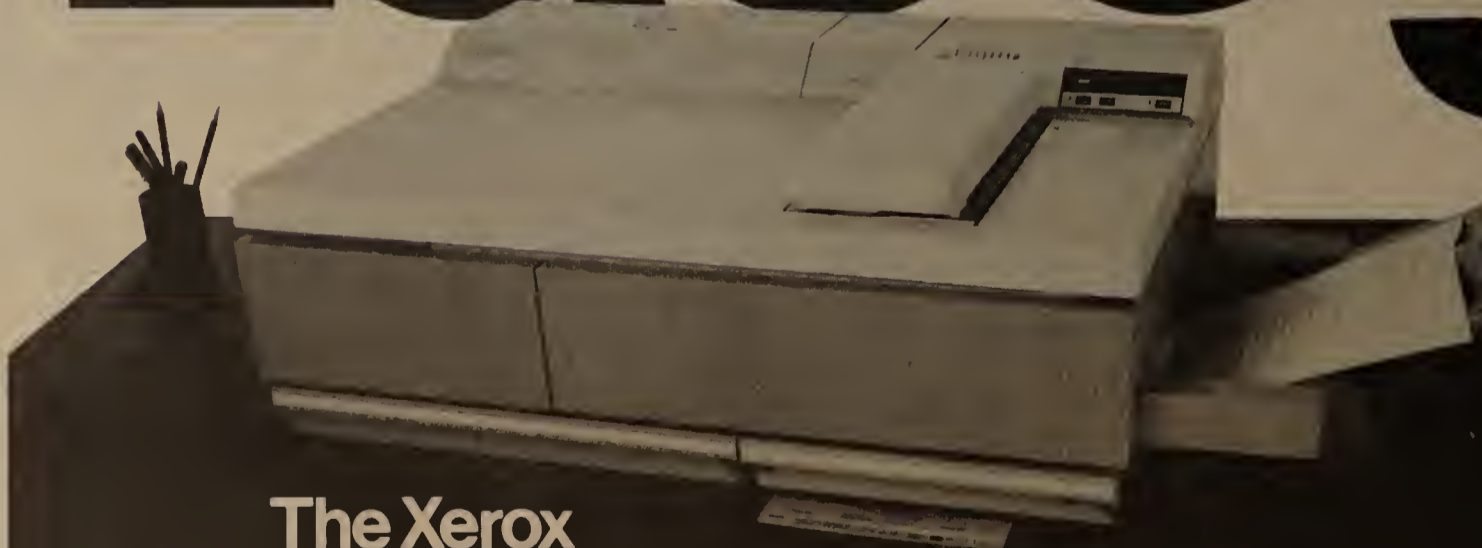
The T³ Scientific Word Processing System is priced at \$595.

TCI Software Research, 1190-B Foster Road, Las Cruces, N.M. 88001.

Martin Marietta Data System's Software Division has announced **Version 1.2** of its **Runit** DOS shell and utilities program and introduced the **Runit Virtual Disk Utilities** program option.

The enhanced version of Runit provides users with the flexibility to design their own main menu and customize the program banner to a name of their choice. The Virtual Disk Utility is used to create virtual disk drives from IBM Personal Comput-

Introducing Lasog



The Xerox 4045 Laser CP

A desktop
laser printer
that's also
a copier.

NEW PRODUCTS/MICROCOMPUTERS

er, Personal Computer XT, AT or compatibles on an IBM mainframe running VM/CMS or MVS/TSO operating systems.

Runit works with Digital Communications Associates, Inc. Irma board, CXI Plus or IBM 3278/3279 emulation boards or an asynchronous port with a Hayes Microcomputer Products, Inc. modem or Renex Corp. protocol converter.

Runit Virtual Disk Utilities requires one disk drive

and 128K bytes of random-access memory. Runit is priced at \$100. With the Virtual Disk Utilities, it is priced at \$250 per personal computer plus a one-time charge for the mainframe ranging from \$3,500 to \$5,500.

Martin Marietta, P.O. Box 2392 Princeton, N.J. 08540.

Data Law Co. has added the **Report Generator** to its line of legal software.

The Report Generator can be used with either the Data-law/PC legal time and billing program or the Litigation Support program. It can create custom reports, add, subtract, multiply, divide and merge information from several reports into one.

The Report Generator runs on an IBM Personal Computer XT, AT or compatible.

The Report Generator is priced at \$695.

Data Law, Suite E, 6341 S.

Troy Circle, Englewood, Colo. 80111.

Shawmut Corp. has announced **Quicken**, a check writing, account balancing and expense tracking software product for personal computers.

Quicken allows users to write, print and keep a record of checks as well as maintain their check registers. It runs on the IBM fam-

ily of Personal Computers and Apple Computer, Inc.'s Apple IIe and IIc.

Quicken is priced at \$99 for the IBM version and \$79 for the Apple version.

Shawmut, One Federal St., Boston, Mass. 02211.

Spectrum Training Corp. has released **Version 4** of its **The Educator** authoring system for the IBM Personal Computer family and compatibles.

The Educator allows the development of computer-based training and application demonstrations. Version 4 is written in C language and has four primary enhancements: It is faster in both authoring mode and in replay; it includes an optional screen capture utility; live applications and procedures can be linked to training; and it is possible to design graphics with a mouse.

Version 4 of The Educator costs \$2,500 per yearly license. The capture utility is priced at \$300.

Spectrum Training, 18 Brown St., Salem, Mass. 01970.

Delphi Data Systems, Inc. has announced **PC/Hibol**, a product designed to develop and test IBM mainframe CICS/VS Cobol applications on the IBM Personal Computer, Personal Computer XT and AT.

PC/Hibol generates CICS/VS Cobol and Basic Mapping Support maps for the IBM mainframe operation as well as microcomputer Cobol and maps for IBM Personal Computer operation from the same program specification, the vendor said.

Interactive programs can be tested or run in production on the personal computer.

PC/Hibol is priced at \$995.

Delphi Data Systems, 9615 Girard Ave. S., Minneapolis, Minn. 55431.

Microsoft Corp. has released **Macro Assembler 4**.

Version 4 features the ability to assemble larger source files with more symbols and more macro text. It offers new assembly switches, screen swapping and 100% source and object upward-compatibility with earlier Microsoft and IBM Macro Assemblers.

Microsoft Macro Assembler 4 runs on any Version 2 MS-DOS computer supporting the newer Intel Corp. 80186, 80286 and 80287 instruction sets as well as the standard 8086, 8087 and 8088 instructions.

It is priced at \$150.

Microsoft, Box 97200, 10700 Northrup Way, Bellevue, Wash. 98009.

Introducing Lasography.

About twenty-five years ago something happened that changed the world of information forever.

Xerox introduced the first plain paper copier, an achievement that brought xerography into almost every office.

Since then, for more than a decade, Xerox has been applying the power of laser technology in high speed computer printing systems. Systems that produce superb documents of unsurpassed quality. Quickly, quietly and cost effectively.

Now, through this process which we've named Lasography, Xerox has come up with a revolutionary product that lets smaller offices and work groups enjoy these benefits, too.

Introducing the Xerox 4045 Laser Copier Printer.

It's the desktop copier/laser printer

with a totally unique dual personality.

For one thing, it's a sophisticated laser printer. It can print up to ten pages a minute. Which is ten times faster than standard office printers.

And while other desktop printers serve primarily one workstation at a time, the Xerox 4045 Laser CP is designed to accommodate four.

All at the same time.

Not only that, but with the Laser CP's graphics capabilities you can merge all the forms, logos, texts and signatures you want printed and produce documents that anyone would be proud of.

But as we said before, the Laser CP has a dual personality. It doubles as a high quality convenience copier.

The Xerox 4045 Laser CP is only one example of what Lasography has to offer your office, remote or distributed

data processing environments.

Because Xerox is already planning ways to apply Lasography toward an even wider selection of products.

All of which will put your office exactly where it belongs.

Light years ahead.

Call 1-800-TEAM-XRX, ext. 179 for information and product demonstration.

Team Xerox

Please send me more information on Xerox Lasography.

- ☐ The 4045 Laser CP.
☐ The complete line of Lasographic printers.

Send this coupon to:
Xerox Corporation, P.O. Box 24, Rochester, NY 14692

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COMPANY _____
ADDRESS _____ CITY _____
STATE _____ ZIP _____ PHONE _____

If you can't wait, call:

1-800-TEAM-XRX, ext. 179

(1-800-832-6979, ext. 179)

179 _____ 013 12/9/85

NEW PRODUCTS/MICROCOMPUTERS

Western Union Co. has released **Version 2** of its **Instant Mail Manager** software for IBM Personal Computers and compatibles.

Instant Mail Manager Version 2 offers increased address list functions, a scroll feature for address list maintenance and compatibility with Ashton-Tate's Dbase II and III. Other features include the ability to save unsent messages in the queue when using Instant Mail Manager's unattended send

and receive mode and the ability to change the path used for each of the software's configuration files, Help files and address list files.

IMM Version 2 costs \$150.

Western Union, One Lake St., Upper Saddle River, N.J. 07458.

Productivity Software International, L.P. has introduced **PRD+**, a software

program that adapts a personal system of shorthand for keyboard data entry.

PRD+ is a memory-resident program that operates on IBM-compatible personal computers. It comes with a prestored word list of hundreds of common abbreviations and a feature that calculates the number and percentage of keystrokes saved during a data entry session. Users can define as many separate word lists as they want. Each word list

can contain up to 40,000 characters.

PRD+ costs \$195 and will be available on Jan. 1.

Productivity Software, 1220 Broadway, New York, N.Y. 10001.

Conetic Systems, Inc. has released **Version 1.1** of its **Higgins Administrative Software**.

Among the new features are compatibility with IBM's

Topview, notification if appointments are scheduled at conflicting times, expanded directory report options, unlimited capability on retrieval and summary screens and files that automatically close and reopen if no entries are made for two minutes.

Higgins Version 1.1 requires an IBM Personal Computer XT, AT or compatible with a hard disk drive, 256K bytes of random-access memory, a color or monochrome display and IBM PC-DOS 2 or Microsoft Corp. MS-DOS 2 or higher.

Higgins Version 1.1 costs \$395 for a single-user copy. The multiuser version ranges from \$695 to \$2,495.

Conetic Systems, 1470 Doolittle Drive, San Leandro, Calif. 94577.

Abacus Computing, Inc. has announced **Indexer** and **Abacus Utilities**, two programs for the IBM Personal Computer family or compatibles.

Indexer, designed to work with word processors such as Micropro International Corp. Wordstar and Microsoft Corp. Word, builds a word list and then produces an index based on either line or page number.

Abacus Utilities can be used to enhance the operation of IBM PC-DOS. The utilities permit the user to copy screens to disk, copy printer output to disk, replace a character string in a file and change the date and time stamp on a file, according to the vendor.

Indexer costs \$49.50, and Abacus Utilities costs \$24, the vendor said.

Abacus Computing, 271 Vose Ave., South Orange, N.J. 07079.

Systems

Targa Systems Corp., The Travelers Cos. and AT&T's Electronic Photography and Imaging Center have introduced the **Decision Images Presentation System** that integrates color-television-quality pictures and sound with information and presentation graphics.

The Decision Images System includes the Decision Images IBM PC-DOS-based software and the AT&T Truevision Video Display Adapter with Digital Enhancement board that displays more than 1,000 colors simultaneously on standard digital red-green-blue monitors.

The system can be used for delivery of product information, management presentations and reporting, training, education and sales and marketing support.

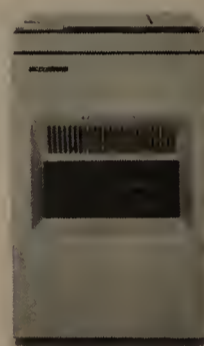
The product is priced from \$1,400 for basic workstation hardware and software to approximately \$10,000 for a

Continued on page 104

XEROX



9700 Laser
Printing System



2700 Laser
Printing System

As you can see Xerox has developed an entire family of laser printers.

Each one designed to fit a variety of needs.

But they all have many things in common.

For instance, Xerox has long set the industry standard for quality printing. The laser printers you see here uphold that standard nicely.

Our laser printing speed is as versatile as your output needs.

From our small desktop 4045 Laser CP's ten pages a minute, to our high volume 9700's 120 pages a minute.

You can handle everything from a few quick documents at a workstation, to thousands of catalogues.

But the flexibility of Xerox laser printers doesn't stop with speed or

output. They're versatile enough to give you a choice of hundreds of type styles.

Four of our models can produce graphics with stunning clarity.

And all of them, the 4045, 2700, 3700, 8700, and 9700, will even print out almost any kind of form, not to mention text, tax forms, invoices, billing statements, and catalogues.

And our laser printers are so quiet that, in many cases, you hardly know they're there.

The point is, whatever your size or application, Xerox has a laser printer that seems customized to your needs. For your office, remote and distributed data processing environments.

All providing you with extremely cost effective laser printing solutions.

Which shouldn't really surprise anyone.

After all, Xerox invented laser printing.

So our entire family has something other printers find hard to duplicate.

It's called quality. And a built-in dependability that was meant to last a long, long time.

All backed by something special.

The Xerox name and the team that goes with it.

Team Xerox.

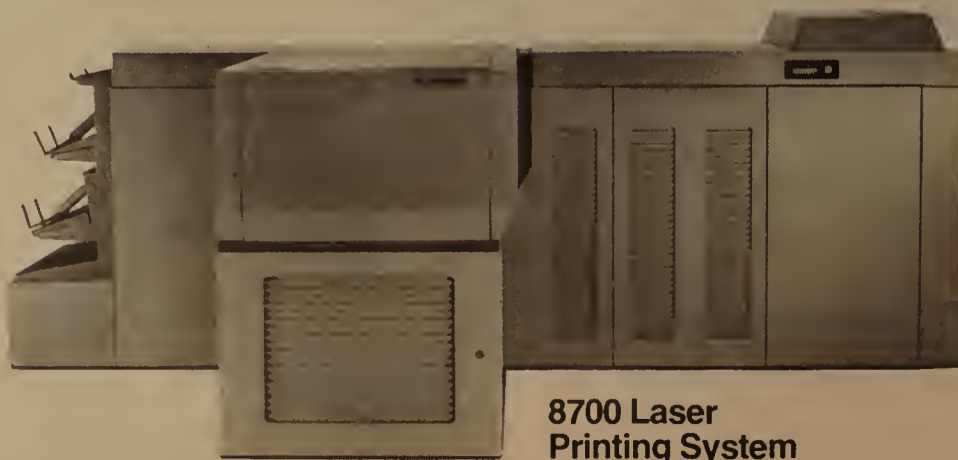
We'll send you a lot more information on our whole line of laser printers. Just send in the coupon.

Or simply call 1-800-TEAM-XXR, ext. 179. It may be the easiest step you'll ever take to move your office ahead at the speed of light.

Team Xerox



3700 Laser
Printing System



8700 Laser
Printing System

So the
top guy said,
“What does a system
that can handle
thousands of
on-line transactions
a day buy me?”

And we said...



"You can own the market"

Transaction Processing. How fast you can do it keeps customers happy and business growing. How well you do it helps keep your company in the black.

Nobody does it better than Honeywell.

Our Transaction Processing systems help give you what you need for high throughput, fast response processing that delivers results where you need them most—the bottom line.

Look at it as your Business Action Partner. Ready to help whenever you need it. Whether for inventory or financial control or personnel scheduling, Honeywell TP can handle it.

DATA INTEGRITY FOR PEACE OF MIND

A Honeywell TP system allows you to keep your data base up to date and well protected, an important consideration where loss or destruction of key data could bring business to a standstill.

Honeywell's data base management and TP software provide features such as audit trails and data images for recovering data. TP also has an automatic restart capability, as well as other data integrity and recovery management features.

AN INTEGRATED APPROACH WITH IBM NETWORKING

Because Honeywell takes an integrated approach to data processing, your TP function is just one part of a total system linking management, individual departments, and end-users in one easy-to-use network.

And Honeywell offers distributed data access and distributed processing in networked systems that include IBM mainframes.

All this in a system tailored to your needs, and able to expand along a clear growth path via our fully compatible DPS 6 family of micros, minis, and superminis. And, of course, our traditional strength in mainframes.

Every system is also backed by Honeywell's worldwide TotalCare™ customer service program that helps your system perform to your requirements. Particularly during crunch time.

Find out how Honeywell's TP Business Action Partner can cut your toughest order processing and billing challenges down to size. Call 1-800-328-5111, Ext. 2799, or write Honeywell Information Systems, 200 Smith Street, MS440, Waltham, MA 02154 for our brochure. It will tell how you can handle more action than ever.



Together, we can find the answers.

Honeywell

NEW PRODUCTS/MICROCOMPUTERS

Continued from page 100

fully integrated artistic creation system, including all components for audio, video and presentation graphics.

Targa Systems, Cityplace, Hartford, Conn. 06103.

Concept Technologies, Inc. has enhanced its Concept System integrated text and graphics system for the IBM Personal Computer XT or AT, the Zenith Data Systems Corp. 158 and the Compaq Computer Corp. Deskpro.

The enhancements include the Conceptequation Setter software package, Version 1.1 of the Concept System software and a stand-alone version of the system's word processor called the Conceptprocessor 50.

Both the Conceptequation Setter

and the Conceptprocessor 50 are priced at \$495. Version 1.1 of the software is available free of charge to current users of Concept 100 or Concept System.

Concept Technologies, P.O. Box 5277, Portland, Ore. 97208.

Absolut Software has unveiled its Add-On, designed to bring AT&T Unix-based multiuser, minicomputer capabilities to the IBM Personal Computer AT.

The package, which fits inside the AT cabinet and allows simultaneous use of Microsoft Corp. MS-DOS with up to 16 additional users, includes Absolut's Wholesale Distribution and Accounts Receivable Software; Unify Corp.'s Relational Data Base Management System; AT&T's Unix System V;

a 12.5-MHz Motorola, Inc. 6800 central processor; 60M-byte cartridge tape; up to 280M-byte hard disk; up to 4M bytes of main memory; and a 1,200 bit/sec. modem.

Add-On is used for order entry, inventory control, purchasing, receiving, quotation generation, prospect tracking and telemarketing.

Pricing starts at \$23,950.

Absolut Software, 2001 Beacon St., Boston, Mass. 02146.

Tandy Corp. has introduced the Tandy 1200 personal computer with two 360K-byte floppy disk drives.

The Tandy 1200 features an industry-standard keyboard and 256K bytes of random-access memory expandable to 640K bytes on the main board. It functions like the IBM Per-

sonal Computer XT, using the same software and option cards.

The floppy disk and printer circuitry is on the main board of the Tandy 1200 so it does not occupy an expansion slot.

The Tandy 1200 is priced at \$1,499.

Tandy, 1800 One Tandy Center, Fort Worth, Texas 76102.

Communications

ABM Computer Systems Co. has introduced Bright Modem, a Hayes Microcomputer Products, Inc.-compatible 200/1,200 bit/sec. internal personal computer-compatible asynchronous modem.

Bright Modem features auto-answer capabilities and will auto-dial in tone or pulse.

Bright Modem uses the personal computer's speaker to synthesize the dialing and call progress sounds that it can detect over the phone line. It features two telephone jacks.

Bright Modem is priced at \$199.

ABM Computer Systems, 3 Whitney, Irvine, Calif. 92718.

Packet/3270, an IBM Systems Network Architecture (SNA) 3270 emulator for the IBM Personal Computer that allows access to 3270 SNA host applications via asynchronous modems has debuted from Packet/PC, Inc.

Four functions are implemented: IBM 3278 Model 2 CRT/keyboard emulation; file transfer; application program interface; plus data integrity and compression during transmission.

At the Personal Computer, Packet/3270 requires IBM PC-DOS 2 or higher, 128K bytes of memory and an asynchronous communications adapter. MVS or MVS/XA running VTAM Version 2 or greater is needed at the host. The NCP Packet Switching Interface is required in the IBM 3705 communications controller.

A Packet/3270 host license costs \$7,500; the Personal Computer license fee ranges from \$145 to \$295, depending on volume.

Packet/PC, Suite 412, 266 Pearl St., Hartford, Conn. 06103.

Storage

Microscience International has introduced Easycard, a 20M-byte disk drive on a card for the IBM Personal Computer, AT&T PC 6300 and compatibles.

Easycard plugs into slots on any of the personal computers. It can be connected to an additional 10M-, 20M- or 30M-byte hard disk or streaming tape drive. It has a data transfer rate of 5M byte/sec. and an average access time of 80 msec.

Easycard requires IBM PC-DOS 2 or higher.

It is priced at \$1,095.

Microscience International, 575 E. Middlefield Road, Mountain View, Calif. 94043.

Quadram Corp. has added the Quadtape 20MB cassette and the Quadtape 60MB cartridge, two internal half-height tape streamers, to its hard disk drive product line.

The Quadtape 20MB cassette has a 90 in./sec. tape speed, a recording

Continued on page 106

UDS delivers 212A LPs at rock-bottom prices

The ultra-compact UDS 212A LP is fully compatible with the Bell 212A. It is an originate/answer unit with 300/1200 bps full-duplex asynchronous communications capability and auto-answering. Yet it requires absolutely no external power source; the modem draws its operating energy directly from the telephone circuit.

The 212A LP is simple to install—one cable (terminated with standard RJ-11 jacks) connects the modem to your telephone handset, while another runs from the modem to the telco outlet. The unit fits directly under your telephone.

It's simple to operate. A TALK/DATA switch enables you to return your telephone to the voice mode when you're not communicating data. That switch is the only control. And the unit is FCC certified for direct connection to the telephone network.

In short, the 212A LP is your most cost effective entree into the 212 world. It's low-priced, line-powered and available immediately.

For technical details and quantity prices, contact Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805. Phone 205/837-8100; Telex 752602 UDS HTV.

\$195

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Call toll-free, today, for more information about the new WY-30. You may never look at terminals the same way again.

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NEW PRODUCTS/MICROCOMPUTERS

Continued from page 104

density of 8,000 bit/in. and a transfer rate of 86K bit/sec. The 60MB cartridge unit has a 90 in./sec. tape speed, an 8,000 bit/in. recording density and a 90K bit/sec. transfer rate.

The Quadtape 20MB cassette is priced at \$1,095 and the 60MB cartridge is priced at \$1,795.

Quadram, One Quad Way, Norcross, Ga. 30093.

Printers/plotters/peripherals

Calcomp has introduced the 2500 series of digitizers for personal computer-based workstations in applications such as computer-aided design and graphic arts.

The 25120 has an active digitizing area of 12 in. by 12 in. The 25180 has an active digitizing area of 12 in. by 18 in. Both models allow selectable

resolution of up to 1,000 lines per inch.

The Model 25120 costs \$950, and the Model 25180 is priced at \$1,400.

Calcomp, 2411 W. La Palma Ave., Anaheim, Calif. 92801.

Calcomp has introduced its **Colormaster** thermal transfer plotter-printer for personal computers.

Colormaster features seven colors, a speed of approximately 1.5 minutes per ANSI-size-A page, a horizontal resolution of 203.2 dots per inch and a built-in rasterizer.

Colormaster comes with one color and one monochrome ribbon, 500 sheets of paper, transparencies, a user's and a programmer's manual.

Colormaster will be available in January for \$4,495.

Calcomp, 2411 W. La Palma Ave., Anaheim, Calif. 92801.

Fujitsu America, Inc. has announced the **SP320E** daisywheel printer.

It features 88-, 92-, 96- and 192-character print wheels, full extended character set, IBM Personal Computer graphics character set compatibility and Diablo Systems, Inc. 630 extended character set command code compatibility. It has a dual Centronics Data Computer Corp. parallel and RS-232C serial interface, a print speed of 48 char./sec., proportional line spacing programmability and word processing functions.

The SP320E costs \$1,495.

Fujitsu America, 3055 Orchid Drive, San Jose, Calif. 95134.

Link Technologies, Inc. has announced **PC Term**, a multiuser terminal for the IBM family of personal computers.

PC Term features a 14-in. green or amber CRT that displays the full 256 character set in the IBM Personal Computer font style. It supports both 80- and 132-column display.

PC Term costs \$649.

Link Technologies, 2260 Paragon Drive, San Jose, Calif. 95131.

Zenith Data Systems Corp. has introduced its **ZVM-1330** 13-in. high-resolution color video monitor.

The monitor features a 25-line by 80-char. format that supports a 640-by 240-pixel resolution display. It offers 16 colors. It has on/off, brightness and contrast controls as well as horizontal and vertical size and positioning controls on the front panel.

The ZVM-1330 monitor costs \$649.

Zenith Data Systems, 1000 Milwaukee Ave., Glenview, Ill. 60025.

Board-level devices

Aid/88, an intelligent diagnostics system for IBM Personal Computer and Personal Computer XT has bowed from **Vu-Data Corp.**

The Aid/88 personal computer tester is preprogrammed with 10K bytes of software that monitor IBM's resident diagnostics.

Aid/88 reports the test that causes the Personal Computer to halt. In addition, internal firmware lets the unit perform bus-shorted and bus-stuck testing. By using two keypad buttons, an operator can test a good system board in 25 seconds.

Aid/88 sells for \$2,795 in single quantities.

Vu-Data, 7122 Convoy Court, San Diego, Calif. 92111.

Victor Technologies, Inc. has introduced its **Speedpac 286** turbo-board for the IBM Personal Computer, Personal Computer XT and Victor VPC.

Speedpac 286 fits into a half slot. It uses an 8-MHz Intel Corp. 80286 microprocessor that increases speeds by more than 600%.

The introductory price of Speedpac 286 is \$595. After March 31, the price will be \$795.

Victor Technologies, 10 Victor Sq., Scotts Valley, Calif. 95066.

ABM Computer Systems has announced the **Mini-EMS** board, a short-slot board that provides up to 1.5M bytes of Lotus/Intel/Microsoft Expanded Memory Specification memory, an advanced random-access memory disk, a pop-up windowing spooler and diagnostic software on a self-booting disk.

Up to 512K bytes of parity-protected memory can be installed on the main short board. The Expansion RAM Module provides up to an additional 1M byte of memory. Up to 8M bytes of memory can be supported on a single machine using multiple Mini-EMS boards.

List prices are \$169 for the main Mini-EMS board with no bytes of memory installed and \$79 for the Expansion RAM Module with no bytes of memory installed. Memory is

Continued on page 110

"The Convex C-1 system is the affordable answer for the supercomputer community. We have enhanced the C-1 system for Cray compatibility — the technology is truly impressive."

— Frank Greene President, ZeroOne Systems, Inc., Supercomputer Integrator and Computational Services Manager for NASA Ames and for the John von Neumann Supercomputer Center

"The Convex C-1 achieves the performance of a supercomputer at a fraction of the cost — we offer real-time solutions in hardware and software."

— Steve Wallach

VP Technology, Convex Computer Corporation

The Convex C-1™ supercomputer and its software offer an unbeatable combination for cost-effective, high performance, scientific computations. Executing 60 million operations per second, the C-1 performs at 25% the speed of a Cray™ 1S — yet lists at \$495,000 — about 10% the cost of the Cray.

The C-1 supercomputer, which Convex is now shipping in volume, provides 64-bit integrated scalar and vector processing, an optimizing, vectorizing FORTRAN '77 compiler, the UNIX™ operating system, full interactivity, and is a general purpose, stand alone

machine. ZeroOne Systems offers the C-1 with Cray compatibility, both as a stand alone system or in a front-end configuration. Most applications are ideally suited for the C-1 — it has a compute-intensive kernel with extensions provided for asynchronous I/O and disk striping for I/O intensive applications. Finally, the C-1's networking capabilities maximize the system's flexibility either as a computational server, as a front end to a Cray, or as a stand alone interactive real time analysis engine.

For more information on the C-1 system and its available software, contact: Convex Computer Corporation, 701 N. Plano Road, Richardson, TX 75081, 214 952-0200.



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Unblurring the distinction between speed and performance.

In the torrid race to claim the fastest high speed modem, many companies advocate basing your buying decision on one thing: speed. What's happened, unfortunately, is that these speed claims are beginning to blind people. So much so, in fact, that modem purchasers are losing sight of the difference between modem speed and data throughput. Between addition and integration. And between out-of-pocket expenditures and intelligent investments.

Codex would like you to take one step back for just a minute. Allow us to submit the following questions.

What level of performance do you

really want out of a modem which operates at 19,200 bps? How much more efficient will it make you? How much throughput can you expect? What support, such as line conditioning, centralized network control capabilities and staffing will you need to maximize efficiency and control costs?

These are the *most important considerations* when evaluating a high speed modem. Any high speed modem. Especially ours.

Introducing the Codex 2680

It's the thoroughbred of 19.2 kbps modems. We say this so unequivocally

because the Codex 2680 fully answers the most important considerations. And because it is not a revolutionary design, but rather an evolutionary one, based on the technology of a

increasing expenses or staff resources.

You can use D1 lines instead of C-conditioned lines, so you can achieve substantial savings in monthly leased-line costs. From day one.



The new Codex 2680 19,200 bps high speed modem.

series of modems which have remained the most technologically advanced in the industry since they first appeared: the Codex 2600 Series.

*High speed modems vs.
high speed communications*

The Codex 2680 sets new standards for performance and reliability among very high speed modems. By combining the Codex proprietary custom VLSI design and the power of the Motorola 68000 microprocessor, the Codex 2680 provides the highest and most consistent level of data throughput of any 19.2 kbps modem available.

This superior performance is achieved in a number of ways. By utilizing enhanced 64-state 8-dimensional Trellis Coded Modulation (64 x 8 TCM), one encoding bit is interwoven with every 28 bits of the original transmitted stream. The result, quite simply,

enables the receiver to both interpret and select the best sequence of bits which most accurately represent the data transmitted. Codex also positions the error-correcting data in a smaller signal constellation, thereby making it less susceptible to line disturbances.

In actual use the Codex 2680 delivers 99.9% error free data over more than 90% of standard 3002 D1 conditioned lines at 19.2 kbps.

The Codex 2680 also incorporates Codex's Adaptive Rate System (ARS). This feature eliminates the need for manual monitoring and reconfiguring of data rates, optimizing throughput under all line conditions.

The big payoff

Speeds of 19.2 kbps allow you to realize dramatic increases in efficiency and productivity. Without

And these savings add up. Fast. With its standard 2-channel multiplexer, you can eliminate extra lines. For example, by combining two separate 9600 bps circuits into one leased-line at 19,200 bps, typical savings for a New York to LA link are greater than \$24,000 per year.* And that's just in leased-line charges. You'll save more on hardware as well.

What's more, the Codex 2680 offers complete network management capabilities for monitoring and fault isolation. It can operate independently or with your present central site Codex network management and control systems, to ensure greater network availability.

In short, it's a modem that's really a true network system resource.

It's all perfectly clear

Another important feature of the Codex 2680 is the fact that it is shipping right now. Not tomorrow. Now.

If you still have questions or would like a product demonstration, simply call 1-800-426-1212, ext. 227. Or write Codex Corporation, Dept. 707-227, 20 Cabot Boulevard, Mansfield, MA 02048.

The quicker you do it, the faster you'll be achieving what you really want out of a high speed modem.

Performance.

codex
 **MOTOROLA**

*Based on average installation and leasing charges for 3002 D1 circuits as of 10/85.

NEW PRODUCTS/MICROCOMPUTERS

Continued from page 106

available in 256K-byte increments for \$59. A 1.5M-byte board lists for \$602.

ABM Computer Systems, 3 Whatney, Irvine, Calif. 92718.

Corvus Systems, Inc. has introduced two NSC/DXZ Omninet local-area network cards that allow the IBM family of Personal Computers to communicate with Dig-

ital Equipment Corp. minicomputers over the Corvus Omninet local network.

The DQZ card emulates DEC's DZV11 multiplexer and allows the minicomputer to communicate with up to four personal computer users. The DUZ card emulates three DEC DZ11 multiplexers and enables the mini to communicate with all micros located on up to three Omninet networks.

The DQZ Omninet/Q-bus interface kit is priced at

\$2,795. With the DUZ card, the kit costs \$6,395.

Corvus Systems, 2100 Corvus Drive, San Jose, Calif. 95124.

Hayes Microcomputer Products, Inc. has upgraded its Transnet 1000 to 512K bytes of random-access memory.

Transnet 1000 performs document storage, printing and communications func-

tions without using processor time from a microcomputer. It can answer telephone calls using an external modem and store and print messages when no computer is present. The mailbox can operate in the background while Transnet 1000 serves the computer as an intelligent printer buffer.

Transnet 1000 is compatible with computers that have a serial RS-232 port. It connects to printers, plotters and other peripherals via ei-

ther a parallel or serial port. It costs \$549.

Hayes Microcomputer Products, P.O. Box 105203, Atlanta, Ga. 30348.

Paradise Systems, Inc. has introduced the **Modular Graphics Card** that extends the IBM Color Graphics Adapter (CGA) standard to IBM Personal Computer-compatible monochrome monitors as well as to color monitors.

The card adapts CGA-compatible software to monochrome monitors, portraying color values as shades. It displays up to 16 colors on a color monitor and up to 16 shades on a monochrome monitor. It supports full screen graphics and comes with connectors for a light pen and a radio frequency modulator. It also includes a random-access memory disk and print buffer software.

The Modular Graphics Card costs \$395.

Paradise Systems, 217 E. Grand Ave., South San Francisco, Calif. 94080.

Auxiliary equipment

Computer Perfect has announced the **Computer Perfect Kit**, said to protect microprocessors from dust, smoke, dirt, oxide buildup, static electricity and misuse or operator error.

The Computer Perfect Kit contains a maintenance schedule that explains when to care for and service components; disk drive head cleaning disks; disk drive head, keyboard and printer cleaning fluid; antistatic screen-cleaning spray; screen polish; lint-free cloths; cleaning swabs; pressurized dust blower; antistatic room spray; and recommendations for keeping microcomputers in good working order.

The list price is \$49.95.

Computer Perfect, P.O. Box 276, Mahomet, Ill. 61853.

Micro-Software Developers, Inc. has introduced **Bitwriter**, a copy protection and diskette duplication system for the IBM Personal Computer, Personal Computer XT, AT and compatibles.

The Bitwriter system consists of a host-transparent hardware card that plugs into a Personal Computer expansion slot and connects to the existing diskette controller. Bitwriter software activates the card, which writes a magnetic signature on the diskette that can be read by the computer but cannot be written or copied by the Personal Computer controller.

The Bitwriter system is priced at \$1,495.

Micro-Software Developers, 214½ W. Main St., Saint Charles, Ill. 60174.

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sponse time can be plotted together in a single report. Complete archiving facilities are also provided to easily manage the performance data that is collected on a daily basis.

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NEW PRODUCTS/MICROCOMPUTERS

Enigma Logic, Inc. has introduced **Safeword PC-Safe**, a security system for the IBM Personal Computer and compatibles.

Safeword PC-Safe provides positive identification of all personal computer users and automatic encryption of all personal computer data and programs.

Safeword PC-Safe costs \$250.

Enigma Logic, Suite 301, 2151 Salvia, Concord, Calif. 94520.

COMMUNICATIONS

Controllers

Telex Computer Products, Inc. has introduced the **Telex 076** remote control unit, which is capable of supporting up to eight IBM 3270 terminals.

The Telex 076 is compatible with IBM's 3276 controller and allows the attachment of either Telex or IBM 3270 terminals.

It communicates with the host processor using either IBM Synchronous Data Link Control or binary synchronous protocol.

The Telex 076 is priced at \$4,500.

Telex Computer Products, 6422 E. 41st St., Tulsa, Okla. 74135.

Voice/data communications

General Electric Information Services Co. has announced that its **Genie** consumer information service for personal computer users is available at 2,400 bit/sec. in 63 U.S. cities.

Genie allows personal computer users to access a variety of entertainment, information and software exchanges, communications and other

services, the vendor said.

The sign-up fee for Genie is \$18. For 2,400 bit/sec. access, there is a \$10 per hour surcharge, bringing the total cost to \$15 per hour for non-prime-time access and \$45 per hour for prime-time access.

General Electric Information Services, 401 N. Washington St., Rockville, Md. 20850.

Software

Communication Devices, Inc. has enhanced its **Modem Use Monitor** network diagnostic and management system to print a graph that shows a one-hour status of up to 64 modems each minute.

The system detects "ring no answer," "locked-up modems" and hackers trying to get into a system. A 24-hour summary shows peak usage

of 64 modems divided into a maximum of eight trunk hunt groups, displaying the in-use minutes of all modems. The system calculates the Erlangs for each of eight hunt groups on an hourly basis.

Modem Use Monitor comes with a real-time calendar clock and 64 LEDs that display each modem's status.

Modem Use Monitor costs \$2,300.

Communication Devices, Botany Village, 1 Forstmann Court, Clifton, N.J. 07011.

Concept Development Systems has announced **Straight Line**, an asynchronous telecommunications software system that permits computer-to-computer communication, and **Remote Line**, which allows access from one personal computer running Straight Line to another.

Straight Line dials, answers and hangs up the phone on command. Command sequences can be prerecorded. It allows file transfer, terminal emulation and offers over 100 Help screens.

Straight Line runs on the IBM Personal Computer and compatibles and the NEC Informations Systems, Inc. APC III.

Straight Line is priced at \$199. Remote Line is priced at \$99.

Concept Development Systems, Suite 349, 2778 Hargrove Road, Smyrna, Ga. 30080.

Issco has announced **Tell-A-Graf Version 6** software.

Version 6 offers support for six protocol converters, spool file capability and increased graphical interactivity with the pinpoint software option. Tell-A-Graf Version 6 adds 300 chart stencils.

Tell-A-Graf operates on mainframes, minicomputers and certain 32-bit microcomputers from IBM; Digital Equipment Corp.; Prime Computer, Inc.; Hewlett-Packard Co.; Sun Microsystems, Inc.; and Apollo Computer, Inc. It is priced between \$3,600 and \$40,000, depending on the configuration.

Issco, 10505 Sorrento Valley Road, San Diego, Calif. 92121.

Sun Microsystems, Inc. has added **Sunlink X.25** to its Sunlink series of data communications products.

Sunlink X.25 extends Sun Microsystems' wide-area networking facilities to packet-switched public data networks. It offers two types of service: stand-alone or networked Sun workstations. Networked workstations can link to remote stand-alone or networked Sun systems and data can be transmitted between Sun and non-Sun systems implementing the CCITT X.25 protocol.

The software operates directly on a Sun CPU over a local RS-232C port.

Sunlink X.25 software costs \$2,000.

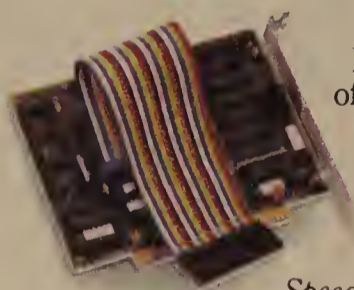
Sun Microsystems, 2550 Garcia Ave., Mountain View, Calif. 94043.

Multiplexers/modems

K212, a single-chip AT&T 212A modem with 300 and 1,200 bit/sec. asynchronous and synchronous communications capability, is available from **Silicon Systems**.

Continued on page 117

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The **SpeedPac 286** works with your existing PC software. Your software library is protected. And, the **SpeedPac 286** is an absolute breeze to install. Measuring just 5" in length, it's the only turboboard that fits into a half slot. An impressive advantage since it frees your long slots for other add-on cards.

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Victor Technologies Inc., 380 El Pueblo Road, Scotts Valley, CA 95066

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CW

Meet our PC Modems

Choosing a modem for your personal computer just got easier.

Modems are remarkable little gadgets. They can connect you and your PC to mountains of data and oceans of information. But up until now, deciding which modem to buy hasn't been easy. So to solve that little problem, IBM is offering two 1,200 bps PC modems. Modems that not only give you the best features currently available on PC modems, but also offer features usually found only on higher priced, higher speed modems.

First, a Brief Introduction to the IBM PC Modems:

The IBM 5841 is a stand-alone modem capable of operating at 0-300, 600 and 1,200 bps in asynchronous mode, and 600 and 1,200 bps synchronous.

Our other modem is the IBM Personal Computer Modem—an internal, half-card modem that operates at 0-300, 600 and 1,200 bps asynchronous.

The Non-Identical Twins

In some respects, these two modems are very similar. For example, they both have Automatic Adaptive Equalization—which means they will continuously fine-tune themselves to compensate for changes and noises on the telephone line. The result is, you can receive data over a wider range of phone line conditions. This is one of those features more often found on faster, more expensive modems.

In addition to automatic answering, both modems offer Adaptive Dialing—which means that if you don't specify either tone or pulse dialing, the modems try tone dialing for one digit, and if that doesn't work, they automatically switch to pulse dialing.

Both modems will automatically redial a number as many times as you tell them to. Or if you prefer, they can switch to an alternate number on a busy signal or a no answer. Once a connection is made, the modems automatically detect and adjust to the incoming transmission speed. They can also initiate an automatic log-on sequence including control characters, ID number and password.

And both modems have extensive "Help" menus, a complete complement of built-in diagnostics, a programmable speaker, and two phone jacks on the back so both your phone and the modem can

be connected to the same line at the same time. You can even switch between voice and data without interrupting the phone call.

A Modem with a Memory of Its Own

The IBM 5841 stand-alone modem has some additional features you don't usually find on 1,200 bps modems. For example, the modem is switchable between asynchronous and synchronous modes and has a 20-entry Dialing Directory. Kept in non-volatile storage, the directory enables the modem to dial up and log on to systems automatically. This feature is most convenient when the 5841 is used with a fixed-function ASCII terminal such as the IBM 3161 or 3163.

The front panel of the 5841 has a complete array of eight LED Status Indicators to give you a quick

visual check on what's happening.

A Half-Card Is Better Than a Whole

Why? Because the IBM Personal Computer Modem can use a short slot in the IBM PC XT and the *Portable* PC. It also fits nicely into a full slot in the IBM PC and the PC AT.

Another nice touch is that a PC diagnostic diskette comes with each of these half-card modems.

Standards & Compatibility

You'll be pleased to know that both modems meet the Bell 103/212A and V. 22 CCITT standards. Both can use the industry standard "AT" command set, as well as the IBM command set.

And both modems have been tested for compatibility with leading PC communications software such as the IBM PC Communications Manager, Crosstalk™ XVI, Smartcom II® and Transporter™.

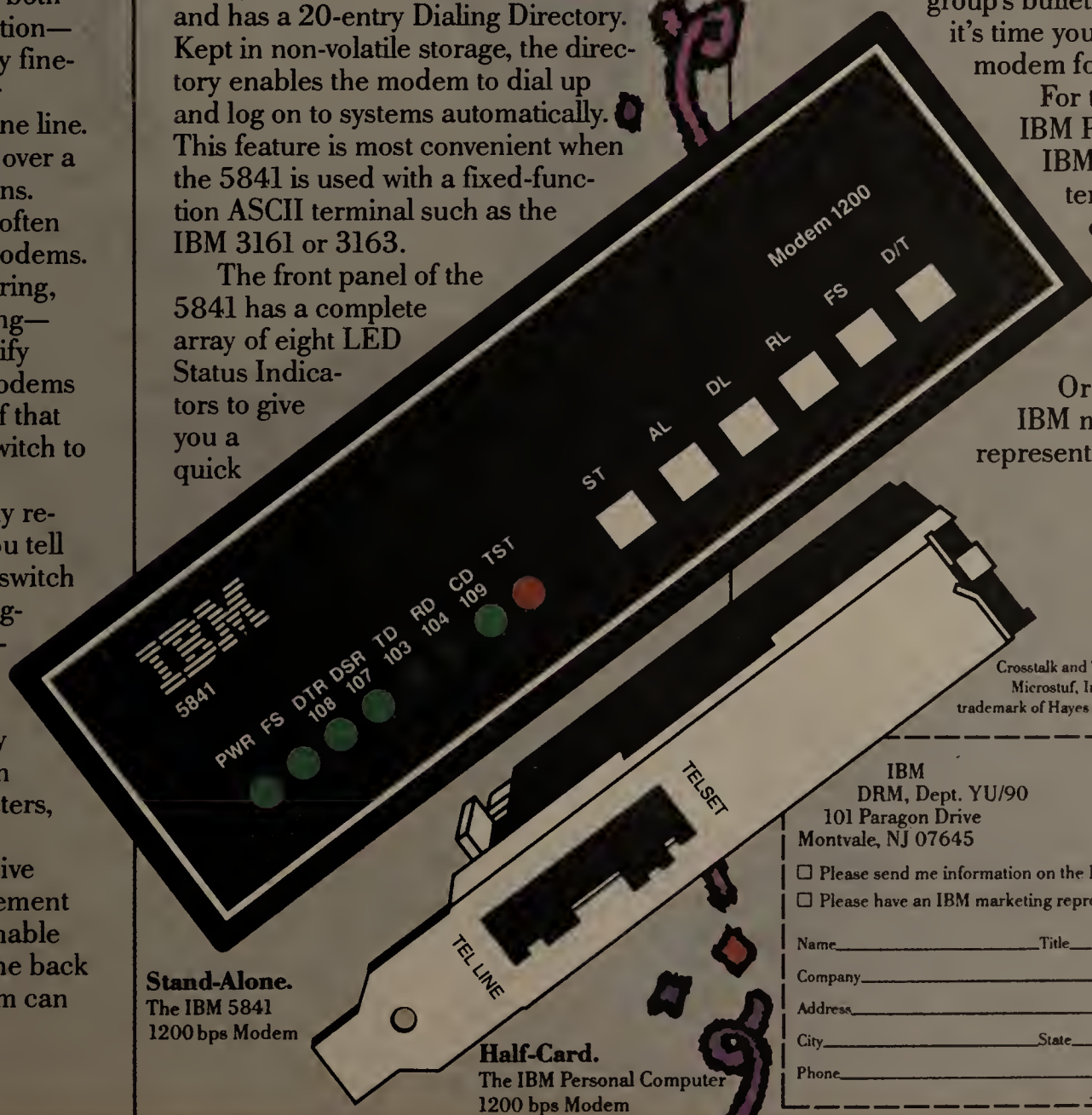
So if you've been thinking about tying your PC into your company's computer, or accessing an outside data base for stock market information or airline schedules, or using electronic mail, or just exchanging information on a user group's bulletin board—then it's time you got an IBM modem for your PC.

For the Authorized IBM PC Dealer or the IBM Product Center nearest you—or for free literature—call 1 800 IBM-2468, Ext. 90/YU.

Or contact your IBM marketing representative.

IBM

Crosstalk and Transporter are trademarks of Microstuf, Inc. Smartcom II is a registered trademark of Hayes Microcomputer Products, Inc.



Stand-Alone.
The IBM 5841
1200 bps Modem

Half-Card.
The IBM Personal Computer
1200 bps Modem

IBM
DRM, Dept. YU/90
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Montvale, NJ 07645

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and Service Source.

NEW PRODUCTS/COMMUNICATIONS

Continued from page 114

The intelligent modem resides in a single 22- or 28-pin dual in-line package. Features include a call-progress monitor and dual-tone multifrequency dialer.

The bus structure controls modem functions and directly interfaces with many brands of 8-bit processors. An optional serial command bus is said to conserve board space and port lines.

K212 modems are priced at \$28.45 in 10,000-piece quantities.

Silicon Systems, 14351 Myford Road, Tustin, Calif. 92680.

Auxiliary equipment

R. K. Burtchaell Co. has introduced **Hy-Tek's Exclude-A-Phone and Tap Detector**.

Exclude-A-Phone blocks out an extension phone from being able to interfere when that line is already in use. Tap Detector warns a user when someone has intruded upon the line in use with both a red light and an audible tone.

Exclude-A-Phone is priced at \$23.95, and Tap Detector costs \$59.95.

R. K. Burtchaell, Suite 201, 516 S.E. Morrison, Portland, Ore. 97214.

Cosmos, Inc. has introduced the **Network Revelation Bump Disk** for its Revelation Database Applications environment.

Each Bump disk allows an additional four users on a local-area network to be attached to any Revelation-based product. Each system can be bumped as many times as necessary to reach the desired configuration, although each bump disk can only be used once.

Bump disks cost \$499 each.

Cosmos, Suite 102, 19530 Pacific Highway South, Seattle, Wash. 98188.

SYSTEMS
& PERIPHERALS

Processors

L/F Technologies has announced that it has added the multitasking **Concurrent DOS** operating system from Digital Research, Inc. to its 1600 series of multiuser business computers.

The 1600 series can support up to 32 terminals, four shared serial printers and four auxiliary devices. Concurrent DOS provides the addition of random-access memory (RAM) disks on systems with 1M byte of RAM. Other features include password protection, network sub-directory support, file locking and record locking.

System pricing with an Intel Corp. 80186 processor, 1M byte of RAM, a 24M-byte Winchester disk, RAM disk, a floppy drive and Concurrent DOS starts at \$6,495.

L/F Technologies, 2800 Lockheed Way, Carson City, Nev. 89701.

The Automation Group, Inc. has announced the **MDL-22**, an intelligent peripheral and data acquisition device for industrial process control, monitoring and data logging.

MDL-22 features include 22 eight-bit analog inputs, 16 digital I/O lines,

serial port for RS-232 or 20-MA current loop communications, parallel printer port, battery-backed real-time clock, quick disconnect connectors, an optional piggyback switching power supply and 40-col. printer.

The MDL-22 is priced at \$159.

The Automation Group, 848-0 Nandino Blvd., Lexington, Ky. 40511.

Data storage

S-MOS Systems, Inc. has announced **Model SRM 2367C** and **Model SRM 2268C**, two 16K-bit static random-access memories (RAM).

Model SRM 2367C is a 16K- by 1-bit RAM with a typical operating current of 80 mA and a typical standby current of 20 microamps. It requires no external clock or refreshing circuit and comes in 35-nsec and 45-nsec versions with 20-pin dual in-line

plastic packages.

SRM 2367C 10,000-piece quantity prices are \$8.12 for the 35-nsec version and \$5.99 for the 45-nsec version. In like quantities, SRM 2268C prices for 45-, 55- and 70-nsec devices are \$5.99, \$4.31 and \$3.52, respectively.

S-MOS Systems, Building 7, 50 W. Brokaw Road, San Jose, Calif. 95110.

Data Devices International, Inc. is offering the **Mark 300** portable magnetic tape cleaner, said to run at 350 in./sec.

Built around the Intel Corp. 8749 microcontroller, the Mark 300 also provides automatic marker placement detection for missing beginning-of-tape markers; automatic unload to remove leader from the

machine when unattended; tactile feel switch; archival wind speed of 200 in./sec.; and self-diagnostic test of critical components and motor.

The unit sells for \$1,995.

Data Devices International, 20235 Bahama St., Chatsworth, Calif. 91311.

Qualogy, Inc. has introduced a line of memory boards, called the **QM-630**, for Digital Equipment Corp's Microvax II and has added **three models** of 5¼-in. Winchester tape systems to its **Cyclone** series.

The QM-630 boards offer 2M or 4M bytes of dynamic random-access memory (RAM) on a single quadwide board. They use 256K-byte dynamic RAM and employ Microvax II's 32-

Continued on page 118

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- **Fast "C" programs without "C" programming.**
- **cEnglish** permits embedded "C" code.
- **"C" language power for systems integration.**
- **cEnglish** programs are 100% portable.
- **No duplication of development effort.**

Sample Program

```
IDENTIFICATIONS
MODULE: Mininame
AUTHOR: bcs
DATE: 8/29/84
/* program that adds first name to a file
GLOBALS
FIXED LENGTH 1 ans
FIXED LENGTH 15 fname
END GLOBALS
MAIN PROGRAM
BEGIN
CLEAR SCREEN
USE "NAMES"
VIEW BY "ID_FNAME" ASCENDING
STORE "?" TO ans
AT 23,01 SAY "Add a record ?
Enter Y or N "
WAIT TO ans
WHILE UPCASE(ans) EQ "Y"
CLEAR GETS
AT 06,01 SAY "Please enter first
name"
AT 06,20 GET fname
READ 1
STORE fname TO record_name
APPEND RECORD
AT 12,10 SAY "Welcome to
cENGLISH " & fname
AT 14,10 SAY "Press any key to
continue. "
WAIT
STORE " " TO fname
STORE "?" TO ans
AT 23,01 SAY "Add another record
Enter Y or N "
WAIT TO ans
CLEAR ROW 1 THRU 24
END WHILE
AT 12,10 SAY "That's all for now !"
UNUSE "NAMES"
END PROGRAM
```

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NEW PRODUCTS/SYSTEMS & PERIPHERALS

Continued from page 117
bit-wide Q-bus.

The three new Cyclone models are the D938GL, containing one 160M-byte, 5¼-in. Winchester; the D968L, combining two 160M-byte drives; and the D998GL, with four 160M-byte drives.

The 4M-byte QM-630 is priced at \$2,495. The Cyclone series models range from \$8,395 for a single 36M-byte Winchester to \$22,395 for the Cyclone D998GL.

Qualogy, 2241 Lundy Ave., San Jose, Calif. 95131.

■
EMC Corp. has announced a new release of its EMCVT-780 memory subsystem used to upgrade Digital Equipment Corp.'s VAX-11/780 computers from older 256K-byte memory cards to 1M- and 4M-byte memory arrays.

The package includes as standard parts 4M-byte memory arrays, an enhanced power supply and memory system diagnostic software.

An 8M-byte EMCVT-780 costs \$19,750.

EMC, 12 Mercer Road, Natick, Mass. 01760.

■
Hewlett-Packard Co. has introduced two external 40M-byte hard disk drives, the HP 9133L hard-disk, stand-alone model and the HP 9134L 3½-in. micro-floppy/hard-disk combination.

Both drives are compatible with the HP 9000 Series 200 and 300 engineering workstations, HP 250 and 260 business computers and Touchscreen II micros.

Features of both include 40M-byte storage capacity, 40-msec access time, the ability to subdivide the disk in as many as eight volumes and an optional 3½-in., built-in microfloppy disk drive for the HP 9133L.

Pricing for the HP 9133L and HP 9134L is \$4,450 and \$4,050, respectively.

HP, 3000 Hanover St., Palo Alto, Calif. 94304.

Terminals

Teleray, Inc. has unveiled Model 20-7305, a Honeywell, Inc. VIP7305 emulator that provides a menu-selectable ANSI mode and displays in either 80- or 132-col. format.

The terminal offers RS-232 and RS-422 interfaces and generates and responds to the same commands as its Honeywell equivalent.

The 20-7305 differs from the VIP7305 in that it provides 5,760-char. display memory, 7,366-char. nonvolatile function memory, a buffered bidirectional printer port, an ability to reprogram its 32 keys and an ability to set up operating parameters from the keyboard. Available in rack-mount or executive (9-in. CRT terminal) configurations, the terminal contains a 14-in. green or amber non-glare monitor.

The Model 20-7305 costs \$1,295.

Teleray, Box 24064, Minneapolis, Minn. 55424.

■
Carroll Touch, Inc. has added a touch system for the Sony Corp. PVM-1910Q monitor to its line of Smart-Frame

computer products.

The 19-in. Smart-Frame unit attaches to the color Sony monitor. It was designed for use with interactive videodisk-based applications such as point-of-sale, public information and training.

The single-quantity price for the Sony PVM-1910Q touch system is \$1,150.

Carroll Touch, P.O. Box 1309, Round Rock, Texas 78680.

Printers/plotters

Avatar Technologies, Inc. has announced the Avatar PA3500 protocol converter designed to link ASCII printers into IBM System/34, 36 and 38 environments.

The PA3500 emulates several IBM printers including the 5224, 5225 and 5256. It connects via standard twin-axial cable and is software and hardware transparent. It supports both serial and Centronics Data Computer Corp.-compatible parallel printers, the vendor said.

The converter allows applications to take advantage of printer features such as dot-addressable graphics, alternate character sets and bar code generation.

The Avatar PA3500 is priced at \$1,495.

Avatar Technologies, Hopkinton Development Center, 99 South St., Hopkinton, Mass. 01748.

Graphics systems

Lexidata Corp. has announced Wiggview, computer graphics firmware for displaying large amounts of seismic trace data used in

geophysical applications.

The product is available as a firmware option on 1,280-by 1,024-pixel Lexidata Lex 90 60Hz raster-graphics display processors. With Wiggview, seismic sample data can be sent directly to the Lex 90 for display of wiggle traces, variable-area displays, variable-density displays and horizon flattening. Users can select type of plot, data, gain, color, trace and sample spacing and trace direction.

The Wiggview firmware option on a Lex 90 system sells for \$2,995.

Lexidata, 755 Middlesex Tnpk., Billerica, Mass. 01865.

VG Systems, Inc. has added five hardware capabilities to its VG 9250 color raster display system.

They are a graphics processing enhancement, a gateway, an extended system memory, a high-speed transformation and clipping and 3270 mode and RS-232C attachment.

These capabilities make the VG 9250 compatible with computer-assisted design, manufacturing and engineering applications software and with software that runs on IBM 4300 or 3400-compatible computers supporting IBM 5080 or 3250 channel commands and order sets.

Continued on page 121

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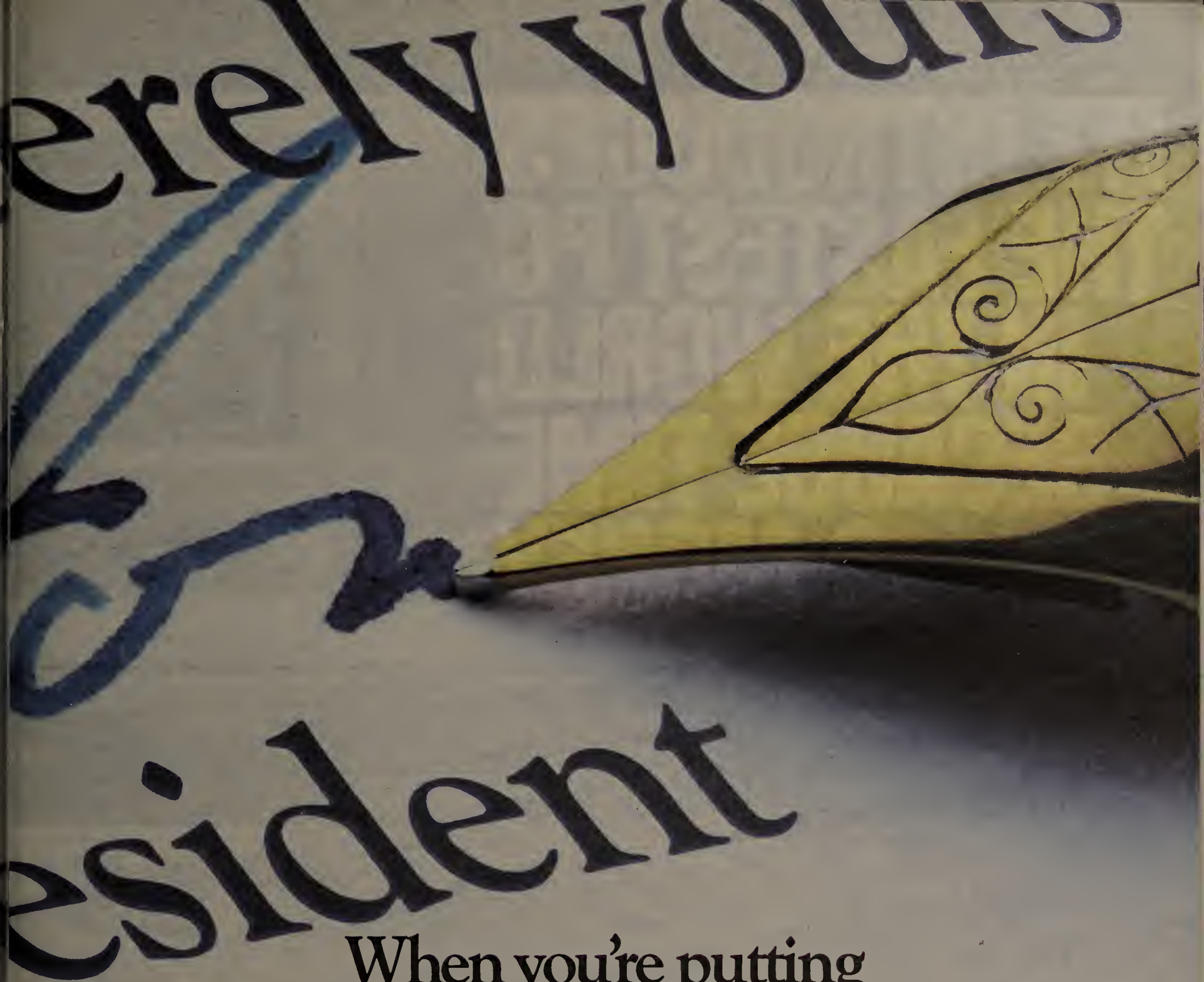


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NEW PRODUCTS/SYSTEMS & PERIPHERALS

Continued from page 118

Prices for a VG 9250 system containing the enhancement modules start at \$26,500 per workstation.

VG Systems, 21300 Oxnard St., Woodland Hills, Calif. 91367.

Power supplies

Brooks Power Systems has announced the **At Surge Stopper**, a surge suppressor that protects computers, terminals, printers, typewriters, disk drives and scientific testing equipment from damage caused by electrical surges, spikes and noise interference.

The At Surge Stopper ab-

sorbs voltage surges greater than or equal to 6,000V and responds to an incoming transient in less than 5 picoseconds.

In addition, the surge suppressor includes an indicator light, an illuminated master on/off switch, 6-ft cord and mounting brackets.

The product costs \$95.

Brooks Power Systems, Suite 102, 3569 Bristol Pike, Bensalem, Pa. 19020.

General Power Systems Co. has developed a series of **37.5-kVA and 50-kVA on-line uninterruptible power systems (UPS)** that provide a

small footprint and low decibel level.

The 37.5-kVA UPS measures 70-in. high by 27-in. wide by 30-in. deep, and the 50-kVA unit is 70-in. high by 33-in. wide by 31-in. deep.

The 37.5- and 50-kVA series are based on sine wave technology and provide a synchronized bypass switch to transfer the power load to and from the utility during an overload.

Configurations include three-phase, 50 or 60 cycles. The units reportedly provide a limit of 3% total harmonic distortion on the output waveform.

Prices start at \$39,950 for the 37.5-kVA series and at \$43,750 for the 50-kVA series.

General Power Systems, 1400 N. Baxter St., Anaheim, Calif. 92806.

RTE Deltec Corp. has added **3-kVA and 5-kVA units** to its 7000 series uninterruptible power systems product line.

Both the 3-kVA and the 5-kVA units offer compact sizing, LED status indicators and a digital readout.

Options that are available include a manual bypass switch and a selection of battery reserve packs offering various backup times.

Prices for the new 7000 series products start at approximately \$5,000.

RTE Deltec, 2727 Kurtz St., San Diego, Calif. 92110.

Board-level devices

Interactive Circuits and Systems, Ltd. has unwrapped the **ICS-100**, a VMEbus multichannel filter board with four simultaneously sampled, optically isolated analog inputs and four analog outputs.

Input, output and filter sections can be separately accessed and controlled from the VMEbus to apply the board to real-time applications, such as multichannel programmable filtering, cross-correlation/autocorrelation, complex adaptive equalization and harmonic analysis.

ICS-100 VMEbus interface capability includes standard and short addressing modes with or without address modifier codes. Users can select any of seven levels of interrupt on the VMEbus.

Single-quantity prices range from \$1,495 to \$3,295.

Interactive Circuits and Systems, 3101 Hawthorne Road, Ottawa, Ont., Canada K1G 3V8.

A 64K-byte CMOS static random-access memory (RAM) series, the **SR64K4-45M**, that offers 45-nsec access times over the full military temperature range, 55

degrees below zero Celsius to 125 degrees C, is available from **Lattice Semiconductor Corp.**

The SR64K4-45M series uses temperature-compensated substrate bias, depletion devices and decoupling circuits to provide a speed derating of less than 1 nsec per 10 degrees C.

Organized as 16K by 4 bits, SR64K4-45M CMOS static RAM memory chips cost \$330 in quantities of 1,000 or more. A 55-nsec version sells for \$285 in similar quantities.

Lattice Semiconductor, 15400 N.W. Greenbrier Pkwy., Beaverton, Ore. 97006.

Cyberchron Corp. has announced **CVM-630**, a high-density 1M-, 2M- and 4M-byte memory card for Digital Equipment Corp.'s Microvax II.

CVM-630 communicates with the CPU through a high-speed private memory bus. It has on-board parity generation and checking.

The CVM-630 operates with or in place of DEC's Model MS630 memory module.

The list price is \$2,495 for the 4M-byte model, and the 2M-byte version sells for \$1,795.

Cyberchron, P.O. Box 164, U.S. Rt. 9, Garrison, N.Y. 10524.

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NEW PRODUCTS/SYSTEMS & PERIPHERALS

Analogic Corp. has announced the **IB 1400**, **IB 1100** and **IB 1101**, a series of intelligent Intel Corp. Multibus 1 and Motorola, Inc. VME bus-compatible, analog, digital, I/O subsystems for industrial applications.

The first products in the series are three microprocessor-based I/O subsystems for Multibus 1-based industrial measurement and control computers. The **IB 1400** is a combination analog and digital I/O subsystem. The **IB 1100** is an intelligent, 16-channel, isolated analog input subsystem, and the **IB 1101** is a 16-channel, industrial analog input subsystem.

Prices range from \$600 to \$1,500.

Analogic, 8 Centennial Drive, Centennial Industrial Park, Peabody, Mass. 01961.

ISI International Corp. has added the **MCB-4LX** dynamic memory module for Intel Corp.'s Multibus to its line of Multibus-compatible boards.

The **MCB-4LX** is fully Multibus and **ILBX** bus compatible. It provides either 20- or 24-bit addressing and is compatible with all Intel single-board computers or equivalents that use Intel 8088, 8086, 80188, 80186 and 80286 CPUs.

The product is available in 256K-, 512K-, 1M-, 2M- and 4M-byte versions.

There are 4M-byte versions avail-

able that sell for approximately \$2,500.

ISI International, 1275 Hammerwood Ave., Sunnyvale, Calif. 94089.

Auxiliary equipment

Data General Corp. has announced **Spare Mail**, a mail-in exchange and repair service for spare parts from its computer systems.

The service offers four levels of spare parts exchange. **Spare Mail Express** provides emergency next-day delivery of spare parts for exchanges; **Spare Mail Priority** exchanges or repairs parts five days after receipt by DG; and **Spare Mail Saver** provides economy, three-week exchange or repair.

These three levels are said to include automatic installation of the latest engineering change orders. A fourth level, **Spare Mail Repair**, reportedly does not install engineering change orders but provides two-week turnaround to repair and return a customer's parts at the original revision level.

According to the vendor, all repairable DG hardware and peripheral equipment parts, including printed-circuit boards, read/write heads, keyboards, data modules and spindles, are available through this service.

Parts are exchanged and repaired for a fixed price that varies according to the specific part and service option.

DG, 50 Maple St., Milford, Mass. 01757.

Inmac Corp. is offering the **3480 Storage System**, a modular cartridge storage system for IBM 3480 system cartridges.

The system comprises cabinets, shelf units and end panels. Cabinets hold either 240 or 480 cartridges. The 240-cartridge cabinet can be fitted with 12 shelves and the 480-cartridge cabinet with 24 shelves.

Prices for the 3480 Storage System are \$219 for the 240-cartridge cabinet, \$319 for the 480-cartridge cabinet, \$10 for shelf units, \$129 for the end-panel set for single-depth configurations and \$189 for the end-panel set for double-depth configurations.

Inmac, 2465 Augustine Drive, Santa Clara, Calif. 95054.

Tektronix, Inc. has announced the **Tektouch** interactive panel, a touch-sensitive overlay panel for CRTs and other displays, including electroluminescent and plasma displays.

The Tektouch panel may be installed over existing monitor screens or display devices to allow an operator to input data by direct touch. The panel can be manufactured in sizes up to 25-in. diagonal and a height-to-width ratio up to 1:4.

Prototypes are available in sizes up to 13 in. for a cost of \$800 each.

Tektronix, P.O. Box 500, Beaverton, Ore. 97077.

Honeywell, Inc. has introduced the **HVS 300 series** of active optical proximity sensors for industrial measurement and control applications.

The HVS 300 series sensors are said to provide 100% parts inspection at a rate of 1,200 parts per minute.

Applications include verifying the position of moving tools, detecting parts on conveyers and detecting when material is outside of acceptable limits for welding, stamping or drilling.

Prices for the HVS 300 series sensors start at \$550 for single-unit purchases.

Honeywell, Honeywell Plaza, Minneapolis, Minn. 55408.

C. H. Systems, Inc. has introduced **Supersleuth**, a port protection device designed to work with the Hayes Microcomputer Products, Inc. Smartmodem and compatibles.

Supersleuth requires users to enter a name and password. It then disconnects the line, verifies user authorization and, if authorization is confirmed, initiates a callback sequence to the user's telephone. It is menu driven and can be programmed only at the host site. Access to the menu requires a special password.

Supersleuth is compatible with all computers using RS-232C interfaces. It costs \$590, which includes the unit, power supply, manual and telephone cable.

C. H. Systems, Suite 106, 8533 W. Sunset Blvd., Los Angeles, Calif. 90069.

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Brazil has the largest computer market in Latin America. According to data compiled by *Computerworld Brazil*, data processing expenditures for 1984 were valued at \$1.3 billion (U.S.). Sales of MIS/DP equipment and services are forecast to reach \$6.62 billion by 1989.

CW Communications has three publications covering the Brazilian market; *DataNews*, *Micro Mundo* and *PC Mundo*.

DataNews is a weekly newspaper for over 12,000 computer professionals and computer industry executives. *Micro Mundo* is a monthly magazine for over 30,000 personal computer users. And *PC Mundo*, a magazine for IBM PC and compatible

product end-users, is distributed every other month to *DataNews* and *Micro Mundo* subscribers.

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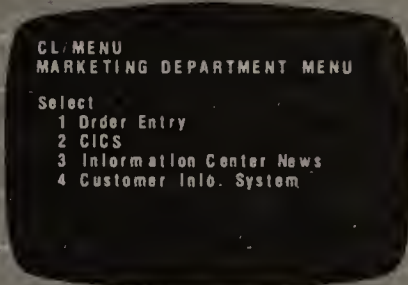

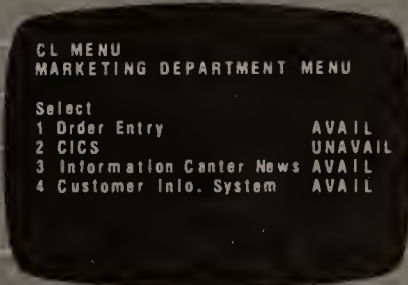
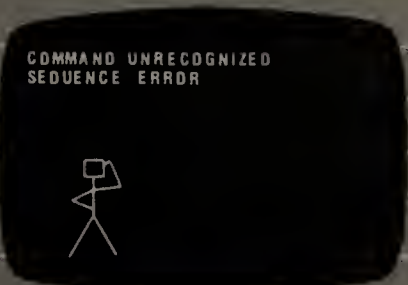
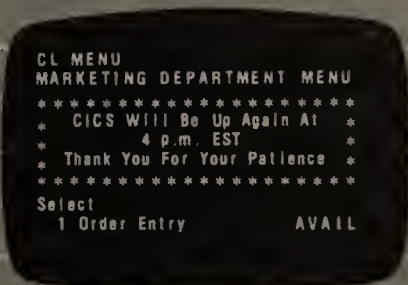
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When Will My Application be Back up?	 <p><i>Without CL/MENU: "Hello again. I'm the person who just had a problem with CICS logon. I forgot to ask you: When will CICS be back up? It's very important!"</i></p>	 <p><i>With CL/MENU: "No sweat. CICS will be back up in just 15 minutes."</i></p>

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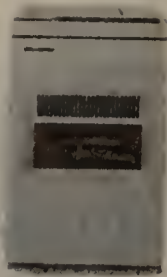
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COMPUTER INDUSTRY

ACTIVE ISSUES

Chip stocks up in market rally

This article inaugurates a weekly Computerworld feature exploring financial market activity regarding publicly traded companies that provide computer-related products. Kathy Porteus, author of the weekly series, is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

Finally, some good news on the semiconductor front.

Since early November, the price per share for each of the major U.S. chip makers — Advanced Micro Devices, Inc., Intel Corp., Motorola, Inc., National Semiconductor Corp. and Texas Instruments, Inc. — has jumped by at least 10%. Moving in tandem with the overall market, semiconductor stock prices have benefited from the latest market rally.

Yet most analysts agree that this rise in stock price also reflects a growing optimism among investors that the battered semiconductor industry is showing certain signs of recovery.

Tom Kurlak, who follows the electronics industry as a vice-president with Merrill Lynch, Pierce, Fenner and Smith, Inc., says he believes that there is "a growing feeling that the [chip] industry is now moving back into better times because order rates have begun to improve and actually have been improving since late August."

Jim Barlage, first vice-president of research for Smith Barney, Harris Upham & Co., says he believes that stock prices now anticipate "an acceleration of orders over the next two or three months."

Monthly order rates, a key indicator for the semiconductor industry, have

See **CHIP** page 136

Zenith's micro success story

Marketing acumen pays off in projected sales growth

By Clinton Wilder

John Frank, vice-president of marketing for Zenith Data Systems Corp., said he believes his company reached a turning point at the Comdex/Spring show back in 1984. "That was the first time we didn't hear anyone walk by our booth and say, 'Gee, I didn't know Zenith made computers,'" Frank said.

Although Frank admitted that he still hears that statement occasionally, the word is slowly getting out on one of the microcomputer industry's most underpublicized success stories. Among the clones and confusion of the IBM-compatible marketplace, Zenith's computer sales will grow by 34% this year to \$370 million, according to market research firm Future Computing, Inc.

Glenview, Ill.-based Zenith Data Systems, the 4-year-old subsidiary of television giant Zenith Electronics Corp., trails only Compaq Computer Corp. in the IBM-compatible market share sweepstakes. Zenith Data Systems President Robert Dil-

worth attributes his firm's success to a fundamental understanding of what the compatible manufacturer actually sells.

"Many people in this business have a fear of calling it an electronic commodity business," Dilworth said in a recent *Computerworld* interview. "Since our mainline business, TV sets, is electronic commodities, we're much more comfortable in that environment. Basically, we move boxes."

"We're not trying to create applications; we're selling hardware in an IBM environment," Frank added. "We believe ours is better, faster and less expensive. That's about it — that and letting the user know that he'll get an adequate level of support."

Although Zenith has achieved much of its success to this point through big-ticket contracts to military installations and colleges, it would still like to do more business with Fortune 500 accounts. At Comdex/Fall '85 last month, Zenith kicked off a national account program that provides more

See **ZENITH** page 134



Dilworth, president of Zenith Data Systems

COMPUTER INDUSTRY NOTES

Sales may rise for the occasion

Good news for personal computer vendors is that this Christmas' buying binge will be as good as, if not better than, last year's holiday sales period, according to Dataquest, Inc. The research firm said holiday sales may be up from 29% to 48% over those of a year ago in dollar terms, but unit sales could decline slightly or increase by as much as 12%.

Digital Applications was launched in 1973 and recorded sales of more than \$8 million during fiscal year 1985. Third-

quarter declines and a gloomy outlook for the remainder of the year forced the board of directors to close the Phoenix facilities, the spokesman said. The company is now seeking a buyer of its assets.

Modular Computer Systems, Inc. (Modcomp) of Fort Lauderdale, Fla., announced the layoff of 12% of its work force, or 120 employees, in a cost-cutting move. Effective early this month, the layoff affects 100 U.S. and 20 overseas pro-

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INSIDE

The issues of leasing equipment with upgrade options/**128**

Apple is using a wide-area network to support its dealers and manage costs/**129**

Ericsson will go it alone in the U.S. market/**131**

INSTANT ANALYSIS

"This development should also be viewed against the background of what is arguably the worst cyclical downturn in the history of the computer business."

— L. F. Rothschild
Unterberg Towbin
investment analysis
of the Applied Data
Research acquisition
by Ameritech

Tandy plays hardball in IBM's Personal Computer park

Lineup includes price, performance, support

By James A. Martin

Tandy Corp. of Fort Worth, Texas, is making it clear it intends to play ball in the park staked out by the IBM Personal Computer family standard.

Along with the company's introduction at Comdex/Fall '85 of the Tandy 3000, said to rival the IBM Personal Computer AT, a Tandy spokesman told *Computerworld* that an IBM-compatible laptop and an Intel Corp. 80386 microprocessor chip-based computer could be forthcoming within 18 months.

Two years ago, Tandy decided its microcomputer operating system, TRS-DOS, was still viable, but MS-DOS-based processors would better lead the computer and electronics

vendor/retailer into the future. Today, with its family of personal computers now complete, Tandy is aggressively courting the home and small business markets with an eye toward moving to the top of the IBM-compatible heap.

It is a heap already overcrowded with "me too" vendors and products, and recent Tandy introductions — most notably its 600 laptop and its AT rival — belong to market segments cluttered with competitive models.

But Tandy is betting that the price and performance of its products, along with a strong national sales and support service, will give the company that necessary competitive edge.

For example, the Tandy 3000 is based on the Intel 80286 chip and is said to be 33% faster and 40% cheaper than its rival while allowing ac-

cess to the same library of software. It is available in hard and floppy disk drive configurations; a Xenix 5-based 3000 supporting up to six simultaneous users is expected during the second quarter of 1986.

Tandy's Graham C. Beachum Jr., vice-president of computer merchandising, suggested in a recent interview that another 80286-based personal computer is being considered. "We're not sure that [the 3000] is the end of the [286] story," Beachum said. He did not elaborate.

In addition, the company is looking at the 80386 chip, said to be the basis of the next microcomputer generation, and at telecommunications technology. "These are all things we will be looking at during the next 12 to 18 months," Beachum said.

Another possibility for Tandy is an IBM-compatible laptop. At present, the company offers three lap-

tops, the most recent of which — the Tandy 600 — was introduced Oct. 28 and offers enhanced word processing, spreadsheet and telecommunications applications.

But some critics have said the 600 will not be a strong contender in the market because it is expensive (\$1,599) and not IBM compatible. In addition, AT&T's recent announcement of its agreement with Ing. C. Olivetti & Co. to produce an IBM-compatible laptop, as well as IBM's own rumored machine, has caused speculation that there is already too much product in a market for which there has been too little demand.

The 600 is most often purchased as a secondary computer, Beachum said, by sales and marketing representatives, journalists, educational researchers and other professionals who require a portable computer.

See **TANDY** page 134

COMPUTER INDUSTRY

Look before leasing: Upgrading old systems can be tricky



OUTSIDE LINES
A. D. Saunders

You are fully aware of the drill. You currently lease or are about to lease a major system, and the bottom line requires that you have a system that meets not only today's needs but also tomorrow's needs. The popular solution is a lease with an upgrade option, that is, a lease that allows you to obtain better equipment as needed.

Before you sign that lease, it might be wise to consider four issues that are always sticking points in the decision.

First, it is necessary to understand what upgrading really means. It is important to distinguish between not wanting the current system and not needing it. The distinction is important because equipment lessors are not in the habit of allowing their customers to upgrade whenever it becomes convenient to do so, unless, of course, they pay a premium. No, it will be necessary to upgrade based upon demonstrable technical needs or overall business purposes.

These technical and business operations considerations usually boil down to three words in the lease. To upgrade requires that you evaluate the terms obsolete, surplus and compatible.

One court, having examined seven technical computer references, including the IBM Vocabulary for Data Processing, Telecommunications & Office Systems, concluded that there are no special definitions of obsolete or surplus. This means that in the absence of some special meaning given to these terms by you and the owner/lessor, the courts will use the common dictionary meaning.

Webster's and the American Heritage dictionaries define obsolete as no longer usable due to outmoded design or construction — a technical requirement. Surplus means excess to need, and therefore pertains to overall business purpose and operations. So on the question of want vs. need, the court advised that if you have an I/O that works with both an IBM 360/30 and an IBM 360/40, that I/O is neither obsolete nor surplus, but compatible with both.

Entire vs. partial system upgrade

This brings us to the question of upgrading the entire system vs. upgrading parts of the system. Some companies argue that when the CPU becomes obsolete, the entire system becomes obsolete. Other companies contend that the entire system is to be upgraded only if the major components, that is, the CPU and the I/O, are obsolete. The system therefore remains, and the parts or items that are obsolete or surplus are upgraded.

Given the fact that reasonable people may differ regarding upgrading items or entire systems, it is absolutely necessary for the lease or

other contract to be clear on the issue. It has been held that the phrase "item of equipment," combined with references to the individual items in a schedule or appendix, expresses an intention to allow upgrading to those specific, individual items rather than the system as a whole. The items of equipment that form the system should therefore be specifically identified, together with model numbers, serial numbers and the manufacturer's original invoice cost.

Courts also tend to favor leases that, by negotiation, allocate risk of loss by obsolescence or change in the character of business. This is an especially important factor when the

cost of the CPU alone may represent nearly one-third the cost of the total system.

If upgrading involves terminating the lease with respect to the item involved and renting or buying another item from the same or another party, then another consideration is who will make the decision to upgrade. The lessee, having knowledge of its own needs, should make the determination. But make sure the contract is clear on the point.

Phrases such as "by lessee in lessee's sole judgment" usually pass muster, but this is not to say that the decision is left entirely to the lessee's unfettered discretion. The sole-judgment privilege must be exercised by

the lessee in a reasonable and honest fashion. Upgrading due to growth in the volume of business is legitimate. But upgrading because of savings when the I/O depreciated faster than the CPU does not constitute reasonableness, unless the contract or lease specifically allows for such a cause.

Finally, there is the consideration of the termination procedure itself and especially the termination charges. If the lessor requires payment of a charge upon the rightful exercise of the option to terminate, it may be wise to have the contract require that both parties use their best efforts to obtain written offers for the purchase of lease of each

See **LOOK** page 132

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Saunders is a Boston-based attorney whose practice focuses upon corporate finance and international law.

COMPUTER INDUSTRY

Apple's Macintosh, Geisco network offer business link

Aids communications with remote sites

By Peggy Watt

CUPERTINO, Calif. — Combining aspects of the desktop microcomputer and the wide-area network to link far-flung field offices with headquarters and with each other has produced a communications system that Apple Computer, Inc. is using as a competitive weapon.

That fledgling system first appeared this fall as Applelink, an electronic communications system that now links about half of Apple's more than 5,000 dealers with its corporate

offices. The system was jointly developed by Apple and General Electric Information Services Co. (Geisco) of Rockville, Md., a division of General Electric Co. The generic design, dubbed *Businesstalk* (or *Dealertalk*, depending on the potential customer) is being marketed by Geisco as a service for businesses and features use of Apple's Macintosh micro.

Potential customers include automobile parts and appliance manufacturers or any suppliers of products sold through dealers, according to Geisco representatives.

"Communicating with remote sites is the key," said Steven P. Korn, Geisco's *Dealertalk* marketing manager.

Automatic dial and connection to

the network is traced on screen through a half dozen icons, which are also used to pinpoint problems. Apple's network interface relies heavily on the mouse, the Mac's trademark pull-down menus and icons.

Geisco's network is "very much in the background," and users interface indirectly with the Macintosh. Direct access calls are available in 750 cities, and the network spans 31 countries and 23 time zones, said Matthew Leek, Geisco's Silicon Valley regional manager. The net can accommodate approximately 5,000 simultaneous users and handles approximately 300,000 user sessions daily.

Applelink's mission is to provide Apple dealers with up-to-date infor-

mation and easy communication with corporate sales and support staff, according to Ellen Nold, Applelink project manager.

Dealer support expenses were doubling yearly and rose along with sales. Telephone tag was an entrenched problem. Applelink was born as an attempt to put a lid on "astronomical" phone costs, hundreds of thousands of dollars spent on express mail, a \$500,000 annual budget just to print price lists and ever-increasing dealer support costs — which seemed only to accompany and dampen increased sales, Nold said.

Geisco has added optional access to Gannett Co.'s USA Today Update electronic information service, an on-line conferencing facility, an order service module and electronic software distribution capability, for future customers.

Applelink's system features three bulletin boards, though not all are available to all users. The most heavily used is the technical information bulletin board service for dealers to glean product tips and hear the latest news.

The data bases include price lists and even on-line order forms, which can be printed out and mailed or handled entirely electronically.

Electronic mail is also relied on heavily and is gradually replacing a time-sharing network Apple previously used internally. Icons of in and out boxes indicate delivery, and senders can send "carbon" copies or request return receipts.

Also appearing on Applelink are contributions of dealer interest from Microsoft Corp., Lotus Development Corp. and other developers with Apple and, particularly, Macintosh products.

"We put up a lot of 'how to' messages," said Delores Bergstrom, leader for product support and applications at Microsoft. Early messages explained *Multiplan* functions and offered tips and tricks for using *Microsoft Word* for mailing labels.

Bulletin boards and other on-line systems are becoming increasingly common for support, Bergstrom added. "This is an efficient way of getting a lot of general information to a large number of users," she said.

Applelink subscribers call the system some 4,000 times daily, Nold said. Besides dealers, employees in or dealing with field offices also have accounts. Developers, vendors and engineering groups are scheduled to go on-line with Applelink in the months to come, she said.

Apple subsidizes use

Apple subsidizes its dealers' network use, giving them a free hour of connect time each month and charging a flat \$15 per hour beyond that. Different fees may apply to other subscribers.

Geisco's *Businesstalk* fees are a little heftier than *Appletalk*'s charges. Geisco charges a flat fee of \$35 per hour in prime time and \$18 per hour in off time. Initial hookup fees vary.

The systems rely on the Macintosh interface, and *Businesstalk* customers must negotiate purchase of the computers from Apple, though Geisco's Korn said another interface might be developed if a subscribing firm had a sizable base of another kind of micro and preferred to use it.

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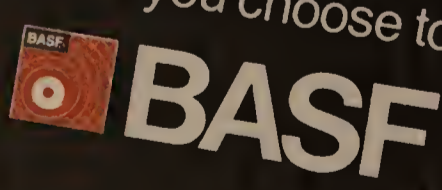
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COMPUTER INDUSTRY

Arco sells share in firm

Ericsson buys out U.S. subsidiary

RICHARDSON, Texas — L. M. Ericsson recently announced the buyout of the joint owner of its U.S. subsidiary, Ericsson, Inc.

L. M. Ericsson will pay \$42 million to joint owner Atlantic Richfield Co. (Arco), which will essentially cover

the accounting write-off taken by Arco earlier this year. The deal is expected to be finalized by Dec. 31.

Arco's divestiture is part of the company's restructuring program that it announced last April. An L. M. Ericsson spokesman said sole ownership will facilitate product introductions and business expansion by the Swedish parent company in the U.S.

Group picks standard

MENLO PARK, Calif. — A standard interface for index file access developed for the AT&T Unix operating system has been selected by European manufacturers for creating, managing and manipulating indexed files.

The standard, picked by the major manufacturers represented in a group called X/Open group, is called C-ISAM. It was originally developed by Relational Database Systems, Inc. of Menlo Park, Calif. The X/Open group includes Groupe Bull, ICL Ltd., Nixdorf AG, Ing. C. Olivetti & Co., Philips N.V. and Siemens AG.

Relational Database Systems said the X/Open group was formed to increase the volume of software applications that are portable at the source code level between different products.

X/Open said in a statement, "Together we have chosen a common standard which will unify a wide variety of systems marketed by the principal European computer manufacturers. The availability of this interface on X/Open systems will not only provide application portability but will ease and encourage integration."

— Bryan Wilkins

AEI lands federal contract

WASHINGTON, D.C. — The National Archives Trust Fund Board has selected Automation Engineering, Inc. (AEI) of Orange, Calif., as its prime contractor for an automated service order and financial data processing system. The base contract of \$384,500 contains options that could expand the contract to \$550,000.

Automation Engineering is a subsidiary of Memcom International Holdings Plc., a systems integration company that specializes in turnkey

electronic filing and information systems.

Under the contract, Automation Engineering will provide hardware procurement, software development, systems integration, testing, installation, maintenance and training services, a company statement said.

The National Archives Trust Fund Board administers historical gifts to the National Archives and disseminates historical and audiovisual materials.

— Mitch Betts

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EXECUTIVE REPORT

Sumware, Inc. has announced the appointment of Rowland W. Day as president and chief executive officer. Prior to joining Sumware, Day served in various executive positions with TRW, Inc.

Wayne Shelton has been named president and chief operating officer of Planning Research Corp. (PRC). Shelton is former president of PRC Government Informa-

tion Systems (GIS), one of PRC's four operating groups. Stuart C. Johnson has been named to replace Shelton as president of GIS. Johnson will also be a vice-president of the corporation.

William D. Engel, former senior vice-president of marketing for Xerox Computer Services, has been named president and chief executive officer of Language Technology, Inc. He replaces George McQuilkin, who remains a director and financial consultant with the company.

Cygnit Systems, Inc. has See EXECUTIVE page 132

COMPUTER INDUSTRY

EXECUTIVE from page 131

announced the appointment of **Philip R. Trapp** to president and chief executive officer. He has also been elected to the board of directors.

Silicon Solutions Corp. has announced the appointment of **Thomas Popek** as president and chief operating officer, a newly created position at the privately held company. Popek was most recently senior vice-president and general manager of Zilog Corp.'s components division.

Edward T. Cuddy has been named vice-president of manufacturing at Delphax Systems, Inc. Cuddy previously was the vice-president of manufacturing operations at Infinet Corp. and prior to that was vice-president of operations at Prime Computer, Inc.

Martin Marietta Corp. has announced the appointment of **William P. Osborne** as vice-president, communications systems, for its information and communications systems company.

Martin Wei has joined Spartacus, Inc. as the vice-president of engineering. Most recently Wei was director of engineering for the communications networks division at Racal-Milgo, Inc. and has held positions at Bell Laboratories and IBM.

Storage Technology Corp. has announced the appointment of **Harris Ravine** as executive vice-president, chief administrative officer, secretary and general counsel.

NBI, Inc. has announced the following appointments: **John L. Melan-**

son as vice-president of advanced development and **Lynn B. King** as vice-president of engineering.

Avant-Garde Computing, Inc. has announced the following appointments: **Michael L. Sanyour** has been elected president, chief operation officer and director of the company; **Timothy P. Ahlstrom** was elected chairman and chief executive officer; and **F. Morgan Lamarche** was elected vice-chairman.

W. Douglas Hajjar has been appointed chairman of the board, president and chief executive officer of Telesis Systems Corp., replacing **John J. Schickling**, who has resigned. Hajjar, most recently was chief operation officer, executive vice-president and chief financial officer at Genrad, Inc.

Bill L. Collinsworth has been named senior vice-president operations at Intecom, Inc. Collinsworth joins Intecom from Storage Technology Corp., where he held a number of managerial and executive positions. Prior to that he was with Texas Instruments, Inc. for a number of years.

Apple Computer, Inc. has announced the promotion of **Deborah A. Coleman** from director of manufacturing to vice-president of manufacturing.

Cipher Data Products, Inc. announced that **Gary E. Liebl**, formerly group operating officer for the Information Systems Group of McDonnell Douglas Corp., has joined the company as president and chief operating officer and is to become a member of Cipher's board of directors.

Tallgrass Technologies Corp. has announced the promotion of **Emmett W. Johnson** to the position of president and chief operating officer. The company has also announced that the current president, **David M. Allen**, will now assume the position of chief executive officer and will continue as chairman of the board.

Charles M. Clough has been elected president and chief operating officer of Wyle Laboratories. As president, he succeeds **Stanley A. Wainer**, who will continue as Wyle's chairman of the board and chief executive officer.

Lancore Technologies, Inc. has announced the appointment of **Peter N. Vicars** as president and chief executive officer of the firm. **Dennis Resnik**, a founder of Lancore, will assume the responsibilities of executive vice-president of marketing and sales and the title of chairman of the board.

Charles Recchio, former president of CPI Systems, has been named president and chief executive officer of Modern Technologies International, Inc.



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From page 128

item terminated and submit a copy to the other party.

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SPECIAL REPORT

Forecast '86

Issue Date: December 30/January 6

Advertising Close: December 13

Having experienced a slump in 1985, the entire computer industry is looking toward 1986 with particular interest and renewed hope. *Computerworld's* December 30/January 6 *Forecast '86* issue will cover the industry's most timely topics while providing a sneak preview of the year ahead.

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Hardware: We'll discuss ... major mainframe vendors and strategies ... viability of AT&T in the real computer world ... status of the chip industry and new technologies ... the encroachment of supermicros on mini and mainframe territories.

Software/Operating Systems: We'll also look at ... user acceptance of IBM's software pricing strategy ... the world of multi-user micro software ... expectations for the micro-mainframe link world ... utilization of Unix in Europe ... efforts for boosting programmer productivity.

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COMPUTERWORLD



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COMPUTER INDUSTRY

Tandy plays ball in IBM's park

From page 127

IBM compatibility, he added, is not necessarily the issue in the laptop market as files created on the 600 can be uploaded via an acoustic coupler to many host systems for further processing.

Beachum said upcoming laptops from AT&T and IBM will "lend some credibility to the market." It is a cluttered market already, he agreed, but the vendor with the right product at the best price should be able to find its niche, and there is room for both compatible and incompatible models.

"If there is to be a laptop compatible, then we probably have the ad-

vantage because of our installed base of laptops and our reputation for the product," Beachum said. "It's something we have to think about."

The laptop is only one corner of the business, however. With its variety of personal computers, including the IBM Personal Computer-compatible Tandy 1000, the Personal Computer XT-compatible Tandy 1200 along with its Vianet local-area network due — after some delay — by year-end, Tandy is hoping to act as an MIS department to small business, according to Beachum.

"The small business manager probably does not make a lot of computer decisions and doesn't have an MIS department to do it for him," Beachum explained. "We want them to be able to come into a Radio Shack store and let us know what their application needs are. We can then ar-

range our products to fit the solution.

"There are too many other vendors and dealers trying to sell [small businesses] more machines than they need," he added, "without much relation to one another. That's why many small businesses are staying away from computers. Tandy can offer the most powerful microcomputer, the 3000 for serious data processing needs, down to a 1200 for word processing and can tie them together with Vianet."

Sales support and service is becoming a hot topic for 1986, and Tandy boasts some 6,000 store locations, 188 computer centers, 330 training centers and some 600 technicians nationwide. "That is all important to a small business manager who doesn't have a DP department that can take care of it all for him and doesn't want to have to go to each

vendor for problems with different kinds of equipment," Beachum said.

Although Tandy posted a 33% earnings decline and only a 2.5% sales increase for fiscal 1985, the company predicts a stronger 1986. Chairman John V. Roach recently told shareholders that earnings should be up 30% for the fiscal year ending June 30, 1986, due to an improved economy, new products and strong sales support. Recent corporate acquisitions of consumer electronics chains Video Concepts and Scott McDuff are expected to offset effects from any continued computer industry slump.

The company is planning to strengthen the training of its sales representatives as new technology emerges and will devote some \$80 million to renovations of Radio Shack stores over five years.

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Friday! on a Micro VAX?

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Zenith's micro success story

From page 127

incentives for local dealer support of its direct sales force.

Dilworth said the new marketing thrust should not change Zenith's reputation as a niche targeter. "The Fortune 500 is really just a new niche," he said. "It's 500 accounts. Compared with our government business, that's really a small number."

While other vendors flounder on boasts of superior technology, industry observers have continued to praise Zenith's marketing-driven approach. "They put their personal computer business plan together in light of realities, not a set of ego goals," said Aaron Goldberg of market research firm International Data Corp. "They say they won't go after every bit of business, only those they can get. It's a pragmatic approach that can be very hard for some companies."

Zenith Data Systems gets much of that approach from its parent company's experience in consumer electronics, where cut-rate Japanese and Korean competition has made falling personal computer prices look tame. And while some of its competitors have shifted so much production offshore that executives are asked if they still run an American company, Zenith continues to build computers in St. Joseph, Mich. — with very little outside component sourcing.

Zenith said it expects microcomputer prices to continue to fall but feels it will be ready. "We've had to learn how to take the cost out of the box and leave the quality in," Frank said. "Other companies look at ways to cut the \$30 parts; we look at ways to cut the 40-cent parts."

Dilworth and Frank said they believe the micro industry's long-term survivors, with the exception of Compaq, will be the billion-dollar players — IBM, AT&T, Apple Computer, Inc., Hewlett-Packard Co., Zenith and possibly ITT and NCR Corp. As the industry continues to shake itself out, extensive capital and marketing resources will be critical assets. "For that reason, I think Zenith has a better chance to do well than the single-product companies," said Future Computing analyst Timothy Williams. "They don't have to put all their eggs in one basket."



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COMPUTER INDUSTRY

Chip stock up in mart rally

From page 127

improved 28% since bottoming out last July. "The fact that orders are increasing slowly but steadily is a positive one for the industry," says Dan Klesken, vice-president of research at San Francisco-based Montgomery Securities. Klesken would like

to see the semiconductor market avoid another boom-bust cycle like that of 1983 and 1984.

Investors are also pleased that chip makers have begun cutting costs. Intel, Motorola, National Semi and TI have laid off workers and shut down production facilities in an effort to lower their break-even points. Advanced Micro Devices, which still abides by its no-layoff policy, has trimmed executive pay 15% and that of salaried

workers by 10%.

Most semiconductor companies reporting losses last quarter say they hope to regain profitability during the second half of 1986.

Despite these indications of a brighter future, the near-term outlook for the semiconductor industry remains troubled.

"The problem," Kurlak says, "is that the recovery in orders which we are now seeing is only what is necessary to support the current

level of shipments. . . . Backlogs are still declining. Until backlogs begin to improve, I think the outlook remains very negative."

Paul Johnson of L. F. Rothschild, Unterberg Towbin is not as negative. Although uncertainty abounds as to when semiconductor unit growth and consumption levels will return to health, he says he believes that shipments could begin improving during the first quarter of 1986.

Referring to recent cost cutting by major semiconductor firms, Johnson maintains that "if we don't see an uptick in shipments, then we are going to see more cuts."

Two other concerns for analysts and investors alike are the increasing Japanese presence in the worldwide semiconductor market and uncertain levels of capital spending in 1986.

Where are the investment opportunities among semiconductor companies? Short term (one to three months), most analysts say they believe that semiconductor stocks will perform in line with the overall market.

Long term, Kurlak of Merrill Lynch said he favors companies targeting market niches with limited foreign competition. He recommends Standard Microsystems Corp., LSI Logic Corp. and Monolithic Memories, Inc. Kurlak also recommends Intel, which should benefit from enthusiasm for its new 80386 microprocessor and its association with IBM.

Both Klesken of Montgomery Securities and Barlage of Smith Barney recommend Intel, Motorola and Advanced Micro Devices. On Johnson's buy list at L. F. Rothschild are Advanced Micro Devices, National Semi and Monolithic Memories.

Notes: From Wang to CCI

From page 127

fessional and management employees.

The move will cost Modcomp \$3.5 million but will save \$8 million in long-term expenses, according to a spokesman. He added that Modcomp will refocus its marketing efforts toward industrial automation.

Computer Consoles, Inc., (CCI) the computer systems vendor that signed on former Wang Laboratories President John F. Cunningham as chairman and chief executive officer, recently announced it had hired a top sales executive away from Wang. John P. Jacobson, who served in a number of sales and operations posts for Wang's international divisions, was named vice-president of international operations.

The American Electronics Association (AEA) said recently it estimates the U.S. negative trade balance with Japan in electronics products will reach a record \$18 billion this year, up 20% from 1984. The U.S. negative trade balance with all countries will total \$8 billion, up 30% from 1984, according to the AEA estimates.



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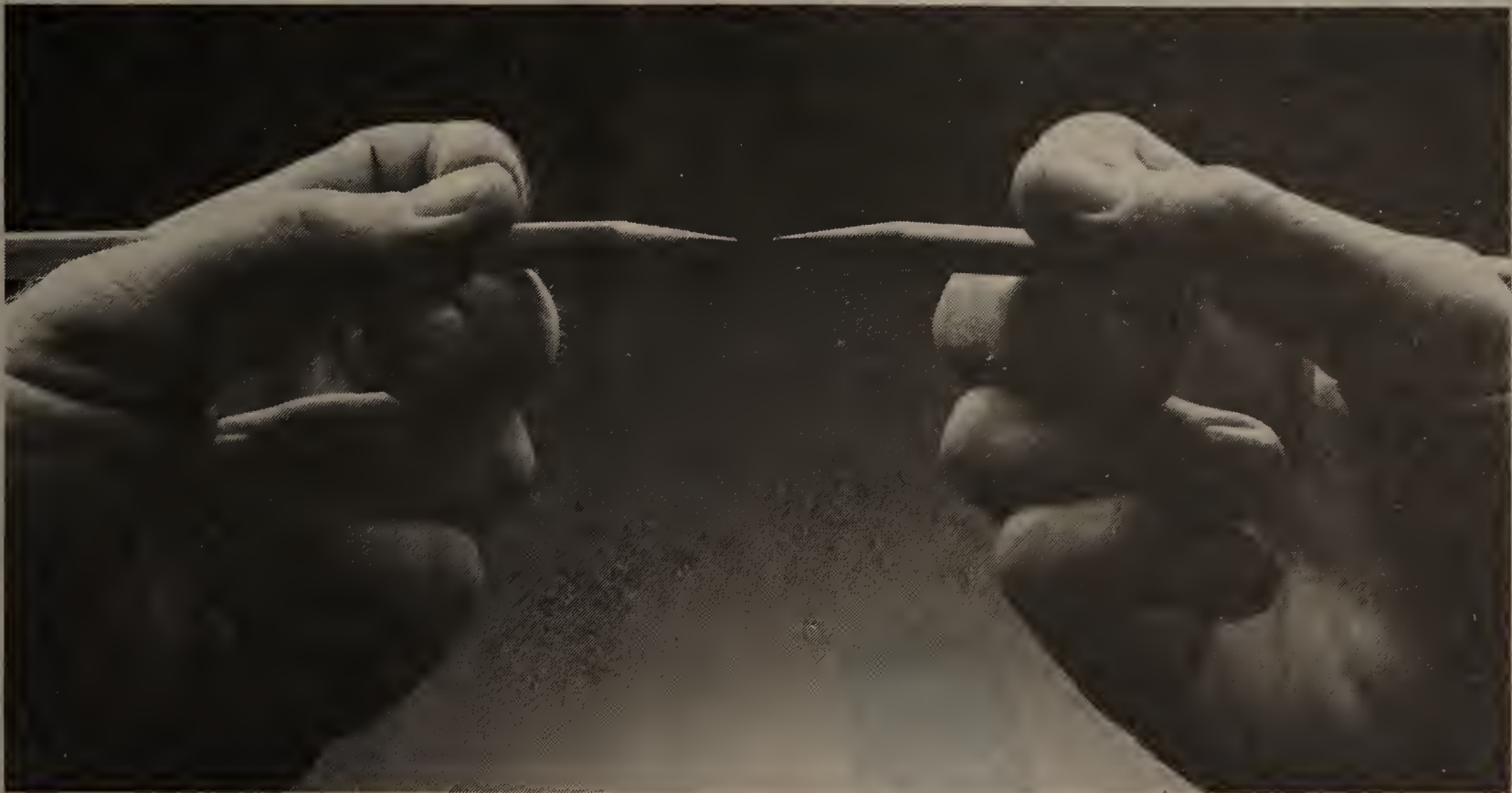
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(South Carolina, Georgia, Florida, Mississippi, Louisiana)

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Senior Programmer Analyst. Fast growing, major Ft. Lauderdale firm seeks professional with extensive CICS and COBOL experience for state-of-the-art data center using IBM OS/MVS/XA with IDMS data base. To \$35,000.

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IDMS Data Base Analyst. Major company seeks IDMS Data Base Analyst with knowledge of GENS, internals and utilities. Excellent benefits. Southern Florida. To \$40,000.

EDP Auditor. Major division of national banking firm needs EDP Auditor with 2 years experience on large IBM mainframes under DOS or OS/MVS. COBOL, SAS and EASYTRIEVE background and insurance applications preferred. Miami location. To \$32,000.

Systems Programming — Banking. Large South Florida institution seeks professionals with 2 years IBM OS/MVS, CICS and ASSEMBLER to maintain and fine tune operating system level software. To \$45,000.

Senior Systems Analyst — Manufacturing. Large NCR manufacturer located in South Florida seeking Senior Analyst in manufacturing with experience using the NCR's "MISSION" system. To \$39,000.

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System Administrator. Major corporation in small town environment seeks HP3000 System Manager/System Administrator. Challenging start-up opportunity. To \$33,000.

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UNIX Programmer. Major financial institution seeks a degreed professional with two years "C" experience. Develop on-line, real-time system for internal use. Benefits include profit sharing, and preferred lending rates. Baton Rouge location. To \$23,750.

Programmer Analyst — Manufacturing. Leading U.S. manufacturer located in Central Florida seeks professionals with COBOL, CICS and DL/I on IBM OS/MVS. To \$32,000.

Compiler Development — Major international 32 bit hardware company seeks talented and experienced individuals for work on FORTRAN, PASCAL, C and ADA compilers. To \$60,000.

Banking Programmer Analyst. Leader in International Banking Software Development seeks an experienced NCR VRX NEAT 3 Programmer. Excellent facility, health club, and complete relocation. Baton Rouge location. To \$24,000.

CAD/CAM Specialist. Major manufacturer seeks a CAD/CAM Specialist for a Robotics Simulation project. Intergraph or Computervision experience a plus. New Orleans location. To \$42,000.

IMS Applications Analyst — Will Relocate. Prestigious Atlanta software development organization needs IMS DB/DC Analysts for a major national project. Join a very professional peer group and enjoy a complete relocation package to metro Atlanta. Two years of specific DB/DC expertise sought. To \$38,500.

Banking Programmers and Analysts. One of Atlanta's largest financial institutions seeks professionals to design and implement a major project in an OS/MVS, TSO environment. Team members will work directly with top management to define, plan, schedule, and implement this dynamic system. One year of banking data processing experience needed. To \$36,500.

Communications Specialist — Super Benefits. Atlanta division of a world renowned manufacturer of aircraft is increasing its technical support staff in communications. Three years of installation and maintenance of ACE/VTAM, ACE/NCP and BYSNC SDLC helpful. Network planning and debugging is preferred. Benefits include a complete relocation package and comprehensive fringe benefits. To \$40,000.

Consultant — Partner Potential in National CPA Firm. Firm with heavy concentration in medium-size client firms seeks Consultant to expand its Atlanta practice. Bachelor's degree, excellent communication skills, and a broad industry reference base support. Will gain a broad exposure to a variety of computer hardware applications. Career path to partner. To \$37,500.

CICS Analysts — Move Into Development. Well-known Atlanta-based service organization is increasing its Analyst staff to implement a major on-line development. Career growth opportunity provides "blue chip" benefits, top salaries, internal education and a recession-proof industry. Two years CICS applications work in a medium to large scale IBM environment sought. To \$32,500.

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(Oklahoma, Texas, Arizona, New Mexico)

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Data Base Analyst — IMS or IDMS Design. Leading firm seeks Analyst to provide internal and client technical support. Develop entirely new software applications. Beautiful Texas hill country location. To \$45,000.

Consultants — Department Expansion. The Houston branch of Big 8 public accounting firm is expanding into new markets and needs expertise in mainframes, minis and micros to service new and existing clients. Some travel and good user empathy are required. To \$45,000.

Data Base Specialist — New Data Center. Fortune 100 company seeks a professional to be responsible for Data Base design, implementation and performance of all its U.S. data processing centers. IBM background required. Dallas location. To \$48,000.

Corporate Management Consultant. New headquarters. Fortune 100 firm, reorganizing its EDP development staff, seeks a professional to define and initiate all new systems development projects. IBM/MVS experience preferred. Dallas location. To \$52,500.

Programmer Analysts — User Interface. Growth-oriented Life Insurance firm which just moved to new offices seeks professionals for expanding Financial, Traditional, Agency and Non-Traditional Systems groups. Utilizes IBM/MVS/CICS and MSA packages. Dallas location. To \$32,000.

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IBM Operating Systems Development. Nationally-known software supplier seeks professional with strong ALC coding experience. Participate in a creative, elite group. Earn royalties on products you develop. MVS/VM internals experience not required but preferred. Dallas location. To \$50,000.

VAX Systems Programmer. Growing suburban data center with multiple DEC VAX's including the new VAX 11/8600 seeks professional with two or more years experience. Dallas location. To \$45,000.

Tandem Applications Programmer — Rapid Growth. Fastest growing bank holding company in Texas is implementing a national ATM network controlled by IBM/Tandem combination. Group of 24 will double in the next 12 months. Dallas location. To \$46,000.

R & D Software Programmer. Large, multinational firm seeks professionals for long-term CAD/CAM, Robotics and "Star Wars" projects. Diverse hardware/software combinations will be used, including DEC VAX, Z8000, SEL, M68000, PASCAL, Assembler, C/UNIX, FORTRAN and ADA. Fort Worth location. To \$45,000.

Technical Support Analyst. Fortune 500 corporation seeks professional with three or more years experience with LAN and PC-to-mainframe links in a commercial environment. Provide pre- and post-sales support to local companies with state-of-the-art systems. San Antonio and Austin locations. To \$40,000.

Software Engineer. Major manufacturer seeks professional with three or more years experience with micro-processor control systems or communications software. Requires C language or 8080 Assembler proficiency. Combine a high-tech environment and the South Texas lifestyle. To \$40,000.

Programmer Analysts — Industry Leader. This growing, national corporation headquartered in Houston seeks professionals with solid COBOL programming skills with an exposure to IDMS. To \$35,000.

Senior Programmer — Passport Current? International firm seeks a professional to function as a Project Leader. Solid RPG III and System 38 skills are required. International travel. Houston location. To \$42,000.

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Programmer Analysts — Banking. Financial institution headquartered in Albuquerque seeks Programmer Analyst to lead implementation of new applications packages. On-line CICS and banking. To \$28,000. Senior Programmer/Analyst To \$33,000.

EDP Auditor — New Position. Rapidly expanding Oklahoma corporation seeks a professional with a minimum of one year auditing experience. To \$30,000.

Data Base Analyst — New IBM System. Oklahoma-based corporation seeks a professional for its state-of-the-art IBM data center. A minimum of three years IDMS design experience preferred. To \$50,000.

Programmer Analyst — State-of-the-art IBM shop seeks Programmer Analyst with CICS and COBOL experience for major systems development. Enjoy the South Texas sunshine. San Antonio. To \$30,000.

Systems Analyst — Professional with three or more years of insurance systems experience sought for IBM environment in a fast-growing Austin-based company. To \$35,000.

Sales Representatives — Major vendor of Office Automation and Business Systems products seeks experienced Sales Representatives for Austin and San Antonio territories. Company needs professionals with two or more years experience selling automation, small business systems, or other state-of-the-art products to Fortune 500 clients. Package high \$40's.

Software Specialists. Rapidly growing Phoenix-based software development organization has openings for software specialists. One position involves customer support, training, and new product research. Second position is in development group for new software products for IBM compatible software for IMS/CICS advanced program products. To \$46,000.

Senior MVS and IMS System Programmers. Nationally-known Phoenix company seeks professional for MVS and IMS performance evaluation, hardware evaluation and planning, extensive TP network design and training of junior staff members. To \$46,000.

Programmer — RPG II Growing Arizona organization seeks a professional with solid RPG programming skills to assist in financial and inventory development. Broad business applications exposure preferred. To \$25,000.

Customer Support Representatives. Phoenix-based vendor is developing new products for SNA financial networks. Seeks technical contributors with communications background for Customer Support Representatives with experience in developing technical requests, project specifications, and managing project development. Will develop IBM SNA standards including new point-of-sale terminal systems. To \$35,000.

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Systems Programmer — Learn MVS. Oklahoma corporation seeks qualified Systems Programmers with a minimum of two years experience. State-of-the-art environment. To \$40,000.

Programmer Analysts — Data Center Expansion. Manufacturer with headquarters in Tulsa suburb seeks Programmers for its growing data center. Three years experience with CICS background preferred. To \$32,000.

Programmer Analysts — Banking Phoenix-headquartered bank, building programming staff, seeks professionals with two or more years experience in banking applications or financial systems. People-oriented shop with a variety of applications exposure and a strong support group. Excellent visibility and interface with banking staff. To \$38,000.

Programmer Analyst — New Development. Industry leader located in rural Oklahoma seeks a professional for its DOS/VS and CICS environment. One year of DOS/COBOL experience desired. To \$29,000.

Programmer Analyst. Major transportation corporation seeks professionals with PL/I coding experience and IMS applications exposure. Tulsa location. To \$35,000.

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Systems Programmers. Major energy-related corporation located near downtown Houston seeks System Software Specialists with MVS or CICS Internals experience. Employee oriented company, dedicated to maintaining a state-of-the-art OS/MVS/XA data center including the installation of a new Information Center. To \$55,000.

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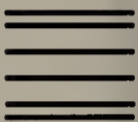
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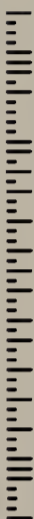
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Robert Half, staffed by EDP professionals for EDP professionals with 80 offices throughout the U.S., Canada & Great Britain, is the largest network of personnel consultants in the Data Processing field. And its establishment in 1948 also makes Robert Half the oldest. One call and you can search the local, national and international markets ALL FEES ARE PAID BY CLIENT COMPANIES, OF COURSE. The following is a partial listing of opportunities and locations.

BOSTON

MGR TECH SERVICES

Career catalyst oppty to manage the IMS & MVS support grps of multi-\$billion corp. Environ is IBM TWIN 308X IMS-DBDC MVS. This SUBURBAN firm seeks proven mgr to play key role in ambitious tech growth plans. **\$65,000+**

SYS PROG MGR

Prominent BOSTON-area corp seeks DOS/VSE specialist to supv staff of 4 in this attractive 43XX CICS data ctr. This position calls for a hands-on pro w/diverse product installations, conv & upgrade exp. Outstanding visibility in an expanding tech environ. Salary to **\$42,000**

FIN'L SYS DESIGNER

Well-estab fin'l svcs org seeks well-grounded tech designer w/structured methodology. Bkgrd should incl IBM OS/MVS CICS COBOL + have some suprvy exp. Hi-vis position within fin'l sys grp. Salary to **High \$30's**

ROBERT HALF
of Boston
100 Summer Street
Boston, MA 02110
(617) 423-1200

BUFFALO

MFG SYS ANALYST

Major F500 mfrw/extensive DEC/VAX based mfg sys seeks several sys supervisors & staff analysts to study & implement shop floor control & other factory automation sys. Excellent co in NY Southern Tier. **To \$52,000**

ROBERT HALF
of Buffalo
420 Main Street
1310 Liberty Bldg.
Buffalo, NY 14202
(716) 842-0801

PROVIDENCE

MIS DIRECTOR

Direct the DP activities in a lge IBM 4300 MVS facility. Min 10 yrs progressive sys mgmt exp. Health care sys bkgd desired. BS degree req, MBA desired. **\$40-50,000**

ROBERT HALF
of Providence
900 Turks Head Building
Providence, RI 02903
(401) 274-8700

AUSTIN

PROGRAMMER

Self-starter. Good analyst. DEC VAX/VMS using Fortran. Business contracts applications. Growth management opportunity. **\$26-30,000**

ROBERT HALF
of Austin
400 East Anderson
Suite 334
Austin, TX 78752
(512) 835-0883

HARTFORD

PROJ MANAGERS

Fortune 100 firm seeks person w/strong proj mgmt skills in mfg or distr. Sys/38, MAPICS are major assets. Excellent benefits, relo. Salary to **\$45,000**

TECH CONSULTANTS

Prestige tech svcs firm has excellent career oppty for people w/strong IMS, DB/DC skills. Hi stability, generous bonuses, limited travel, chance to teach full or part-time at top accounts. Salary to **\$48,000**

SYSTEMS ANALYST

Join a dynamic growing co in a SUBURBAN setting. Work on state-of-the-art fin'l & life sys. Min 5 yrs exp w/Life sys, IBM exp, CICS & data base skills at+. Excellent benefits, growth potential. Full relo. Salary to **\$40,000**

PROG/ANALYSTS

Major fin'l org seeks qualified prog/analysts to work on a number of on-line, devel projs in a CICS/IMS environ. Min 2+ yrs IBM exp & COBOL qualify for these exciting positions. Co provides excellent benefits & full relo. Salary to **\$32,000**

SYS PROGRAMMERS

Min 3+ yrs tech bkgd in IBM/MVS sw + excellent people skills required by CT corp for indiv to assume top tech staff position leading to near term mgmt respon. Full relo costs offered! Salary to **\$40,000+**

MGR DATA SECURITY

Min 8+ yrs DP exp w/current emphasis on data/physical security hw, sw sys. RACF, IBM/MVS, Disaster Recovery, etc., bkgd required for this "start-up" dept! Salary to **\$40,000**

ROBERT HALF
of Hartford
111 Pearl Street
Hartford, CT 06103
(203) 278-7170

OMAHA

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Degree with 4 years DP experience and 1 years systems. IBM mainframe. MVS, DOS and should have knowledge of both COBOL and BAL. Excellent opportunity with salary based on experience.

SENIOR PROGRAMMER

3 years experience IBM mainframe, COBOL, IMS, DB/DC or CICS. Insurance background a plus. Excellent salary and benefits.

ROBERT HALF
of Omaha
7171 Mercy Road
Omaha, NE 68106
(402) 397-8107

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DATA BASE ANALYST

Seeking individual with 10+ years data processing experience including IBM MVS and extensive use of DL/1 and CICS developing major data bases. Any relational data base experience helpful. To **High \$30's**

VP OF DP

Seeking individual with current experience managing programming, operations and technical support departments in an industry which depends upon data processing to remain competitive. Must be innovator with strong technical background and demonstrated ability to implement plans on time and within budget. To **\$70,000**

TELECOMMUNICATIONS MANAGER

Seeking individual with 10-15 years experience in data processing and communications including 6+ years large scale network design. Will be responsible for coordination both voice and data communications activities. To **\$65,000**

SENIOR DATA BASE ANALYST

Seeking individual with 5+ years data base development experience which must include training and hands on data base development experience using DBII. Any CICS or IMS helpful. To **\$46,000**

Marjie Peterson
ROBERT HALF
of Washington State
600 University St., #2328
Seattle, WA 98101
(206) 624-9000

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(405) 843-0800

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of Washington
7316 Wisconsin Avenue
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Washington, DC 20814
(301) 652-1960

ST. LOUIS

FORTRAN & C PROGRAMMER

Engineering applications, DEC VAX hardware using UNIX, C, and Fortran to develop computer aided design and translator systems. Start up opportunity, BS degree required, very good benefits. Excellent growth opportunity! Salary to **\$30,000**

VAX/VMS SYSTEMS PROGRAMMER- GRAPHICS

Service organization specializing in engineering applications needs a VAX/VMS Sys Prog with 3 yrs experience programming in C, VAX MACRO, and DCL. Knowledge of Fortran and/or CAD systems a plus. Salary to **\$40,000**

IMS SYS PROGRAMMER

Fortune 500 firm needs a seasoned IMS Sys Prog with sysgen experience (1.3 best). Must be able to do complete integration, including user and operator training on enhancements and new IMS features. This is an MVS shop supporting CICS, UCC products, TSO and JES. Salary to **\$39,000**

PROGRAMMER

Major Midwest Corp in a rural location needs 2 COBOL programmers with 2-4 yrs experience in an MVS shop. Will program and design business applications using CICS, IMS, some micros and an IBM 3090 CPU. Comprehensive benefits pkg and an excellent relocation package. Salary to **\$32,000**

Randy Pace or
Warner Coffman
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of St. Louis
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

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George Waterman
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127 W. 10th Street
Kansas City, MO 64105
(816) 474-4583

MINNEAPOLIS ST. PAUL

MVS SYSTEMS PROGRAMMER

Multi-million \$ services organization headquartered in Mpls is in the planning stage of a major DOS to MVS conversion. The professional they seek must have a minimum of 2+ years as an MVS systems programmer and a 4-year degree. Great benefits, which are all company paid, accompany this highly visible position. To **Low \$30's**

PROJECT MANAGER

Fast-growing Twin Cities based firm seeks project manager to assume responsibility for analysis, design and overseeing development of new distribution and manufacturing systems. Outstanding new opportunity for advancement at leading Midwest company. Requires manufacturing or distribution systems experience and IBM background. To **\$40,000**

Mark David or Tim Smith
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of Minnesota
3636 IDS Center
Minneapolis, MN 55402
(612) 339-9001

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SR PROG ANALYST

National Corp in S FL is currently expanding development staff. Your technical background must include 3 yrs minimum IMS (DB/DC), COBOL, Large MVS. Opportunity to grow with an industry leader. Excellent benefit program with relocation included. Fee Paid. Salary to **\$44,000**

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SYSTEMS ANALYST

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SO. CONN. & WESTCHESTER

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Opportunity to be top DP'er in this growth oriented company. If you're fast-tracked, career-minded and have experience in SYS/36-34 RPGII, applications development and staff supervision, call George Bellotti for immediate consideration. To **\$42,000**

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Large corp environment seeks systems people with exp in either IBM mainframe, OS/MVS, IMS, SAS, JES 2 and 3, or small systems like IBM 34/36/38, HP3000, DEC/VAX, etc. Great environment to advance in. **\$42,000**

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San Antonio, TX 78201
1-800-531-5402
In TX dial (512) 736-2467

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A growth co. Resp for Internal FORTRAN/Assembler programming in a real-time environment. Start **\$30,000**

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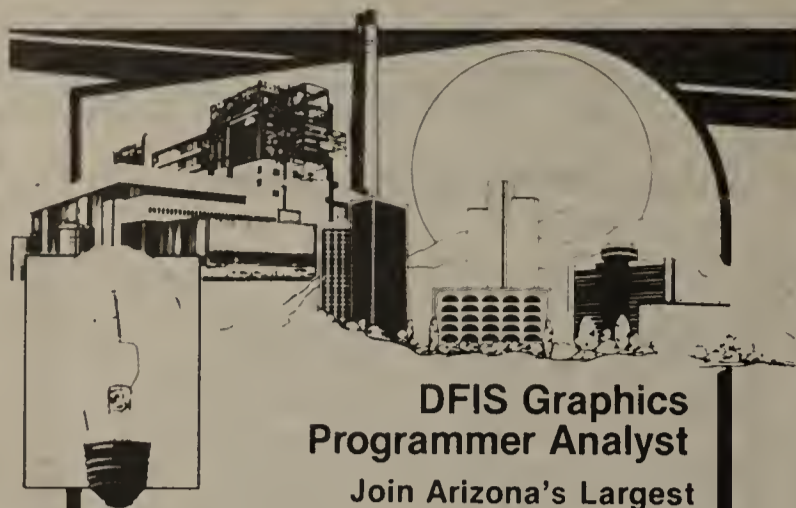
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To learn more about the unlimited attractions of Phoenix, Arizona and our excellent compensation and benefits programs, please send resume to: S. Kranicz, Salt River Project, Dept. CW1209, P.O. Box 52025, Phoenix, AZ 85072-2025.



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We are a dynamic professional services firm with over 40 offices nationwide specializing exclusively in the computer software field.

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- PDP/VAX
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We have positions available throughout the Southeast.

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Equal Opportunity Employer



Growth of our company operations in Monroeville, Alabama has created a need for additional experienced

SYSTEMS ANALYSTS & PROGRAMMER ANALYSTS

Vanity Fair Mills, Inc. needs enthusiastic individuals who wish to contribute to an active, progressive data processing team.

Candidates should possess leadership ability and have excellent communication skills. Degree, or equivalent experience, preferred. Hands-on experience in a manufacturing environment with COBOL, CICS, and an IBM OS/MVS systems is required.

Vanity Fair offers competitive salaries, an exceptional benefit package and a relocation assistance program.

Send resume and salary requirements in confidence to:

Rhondall H. Cruitt
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824 S. Alabama Avenue
Monroeville, Ala. 36462

Qualified individuals only, please
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We offer an excellent salary, ultra-modern work environment and outstanding benefits. For confidential consideration, please send resume or apply at Personnel.

DESERT HOSPITAL
1150 N. Indian Avenue
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PRIME 750 Systems AnalystsTo 42K
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- Real-time systems
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- Telephone switches
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Please send resume to:
Computer Generation, Inc.
3855 Presidential Pkwy.
Atlanta, GA 30340
Attn: P. Hull

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SENIOR PROGRAMMER/ANALYST

A ground floor opportunity exists for a Senior Programmer/Analyst in the insurance and general systems area. The successful candidate will have a strong background in casualty insurance with experience in command level CICS, proficiency in COBOL, knowledge of VSAM under DOS/VSE and good analytical skills. If you meet the qualifications, please send resume with salary requirements to:

Box #CW-B4722
Computerworld
P.O. Box 880
Framingham, MA 01701

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Specifying, designing, implementing, and testing synthetic vision software in robotics applications. Salary is \$16.34 per hour, overtime as needed at \$16.34 per hour. Basic 40 hour week, hours are 8:00 a.m. - 5:00 p.m. Requirements: High School Graduate, ten years college, Ph.D. Degree with Major Field of Study Computer Engineering. Send resume: MESG, 7310 Woodward Avenue, Room 415, (Reference No. 68385), Detroit, MI 48202. Employer paid ad.

ONLINE & DATABASE ATLANTA & SOUTHEAST \$25,000 to \$60,000

Need Programmers, Programmer/Analysts and Contract Programmers for IBM Shops. Relocation Expenses Paid.

Send resume to:

Jim Heard
EDP Consultants, Inc.
3067 Bunker Hill Road,
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Marietta, Georgia 30062
404-971-7281

Senior Programmer - Requires MSEE, Use IBM PC and other hardware and software. \$2,200 per month. Duties: design and implement computer programs to facilitate inventory control, purchasing selection, billing and accounts payable, office management and production/supply. Analyze data and report to president with recommendation. Job site and interview: City of Commerce, CA. Send this ad and your resume to Job# 3746, P.O. Box 9560, Sacramento, CA 95823-0560. Not later than December 24, 1985.

FACULTY FOR EUROPE

The University of Maryland University College seeks faculty to teach undergraduate computer science, computer applications, and information systems management courses on U.S. military bases in Europe. Most appointments begin in August, 1986, though there may be openings as early as March. Minimum requirements include a Master's degree, recent college teaching experience, and U.S. citizenship. Benefits include transportation and military base privileges (PX, commissary, etc.). Frequent travel and the cost of schooling make these positions difficult for those with children. Send your resume to Dr. Lois A. Mohr, Overseas Programs, The University of Maryland University College, College Park, MD 20742. AA/EOE.

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Software Programmer VAX Systems

Responsibilities will include: installing, maintaining and developing system software for the support of a VAX cluster; evaluation and installation of software packages; providing technical support and education to users and data center personnel; and assisting users in the development of application software.

Qualifications for this position include a BS/MS in Computer Science or Information Science, 3-5 years systems programming experience with VAX computers, and experience installing and maintaining VAX VMS operating systems. Working knowledge of computer networks, application development, and one or more high-level language highly desirable. Experience with DECsystem-10 and/or IBM 4300/VM hardware and software a plus.

This position offers a stimulating professional environment in an attractive Connecticut shore area, complemented by a competitive salary/benefits package (relocation assistance available). Qualified applicants should submit detailed resume in confidence to: Charles P. Norris, Personnel Associate, Pfizer Central Research, Eastern Point Road, Groton, CT 06340.



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Manufacturers Bank is seeking an experienced Telecommunications Analyst to work in their Systems Headquarters located in a western suburb of Detroit. Responsibilities will include:

- Planning, designing, implementing and maintaining the telecommunication requirements of a large SNA based network
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- Analysis of voice and data integration

Qualifications: a minimum of **three years'** telecommunications experience addressing the functions outlined above. A demonstrated ability to perform network design and experience in SDLC and BISYNC line disciplines is required. A Bachelor's degree in an appropriate technical field and/or extensive experience in computer telecommunications is required. Please send resume and salary requirements to:

A.E. Davis
Professional Employment
411 W. Lafayette
Detroit, MI 48226

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Your background should include experience with IBM 308X computers, IMS and IDMS Databases in addition to VM and MVS Operating Systems. The ideal candidate holds a BS in Computer Science or other technical discipline coupled with an MBA.

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- Must have a good to high degree of technical knowledge of applications software, computer hardware, data processing communications, programming systems analysis, techniques and systems development practice
- Large scale Honeywell experience required
- DMV experience required in some positions
- Property-casualty insurance or life and health insurance knowledge/experience a plus
- Project leadership knowledge/experience a plus in some positions
- Mini/Micro experience along with large scale hardware experience a must for one position
- Insurance agency experience/knowledge a plus in one position
- Tech support position requires GCOS-8, DPS-6, DN8, GMAP & GRTS
- UNIX/C experience a plus

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(609) 667-4488

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Specialist — Data Base Technologies

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- Security Capacity Planning
- Tuning
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- Defining Subject Data Base
- Normalized Data Base
- Telecommunications Systems
- Data Dictionary Systems

The candidate must possess a solid track record with one of the following DBMS's:

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- DMS II
- ADABAS
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ASSISTANT DIRECTOR - COMPUTER CENTER

Youngstown State University, a state-assisted urban university with an enrollment of over 15,000 students and a full-time faculty of 400, invites applications for the position of Assistant Director at the Computer Center. This position, reporting to the Computer Center Director, is responsible for delivery of key development, maintenance and consulting services to faculty, chairmen, deans and students. Duties include planning future hardware and software directions in conjunction with approved projects. It requires a generalist but with a strong technical background and a contemporary knowledge of (1) MVS, VM, CMS and/or UNIX operating on IBM (or compatible) 3081 mainframes and (2) IBM personal computers, including DOS. Experience with engineering and statistical packages a plus.

The University's Computer Center has a full-time staff of 28 and an annual operating budget in excess of \$1.9 million. Our shop employs a 32 megabyte Amdahl 5868 Multiprocessor (equivalent to 2 IBM 3081s) to serve both academic and administrative departments in a highly integrated fashion with over 650 online devices. The Center will move to a new 100,000 sq. ft. high technology facility (Meshel Hall) in December.

QUALIFICATIONS: Bachelor's degree, with 4 to 5 years experience in large scale IBM computer systems with some significant managerial responsibility, or equivalent combination of education and experience. Master's or Higher degree is preferred.

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Send (1) a letter of interest, (2) a current resume including your salary history, (3) an official copy of a transcript documenting your academic qualifications, and (4) the names, addresses, and telephone numbers of three professional references to:

**Dr. Bernard T. Gillis, Provost
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Send resume to Personnel Office, City of Elgin, 150 Dexter Court, Elgin, IL 60120 by Wednesday, December 18, 1985. EOE.

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Candidate should have degree in Accounting or Computer Science and 2 years audit experience. Requires EDP training or experience. CPA or CISA certificate a plus. Excellent benefits package with a growing corporation. No agencies please. Send resume and salary requirements to:

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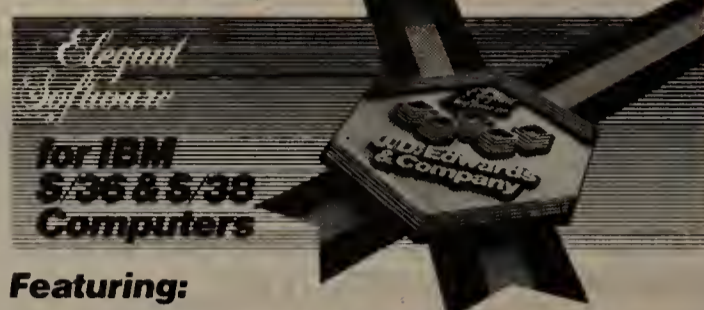
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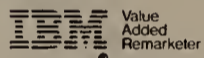
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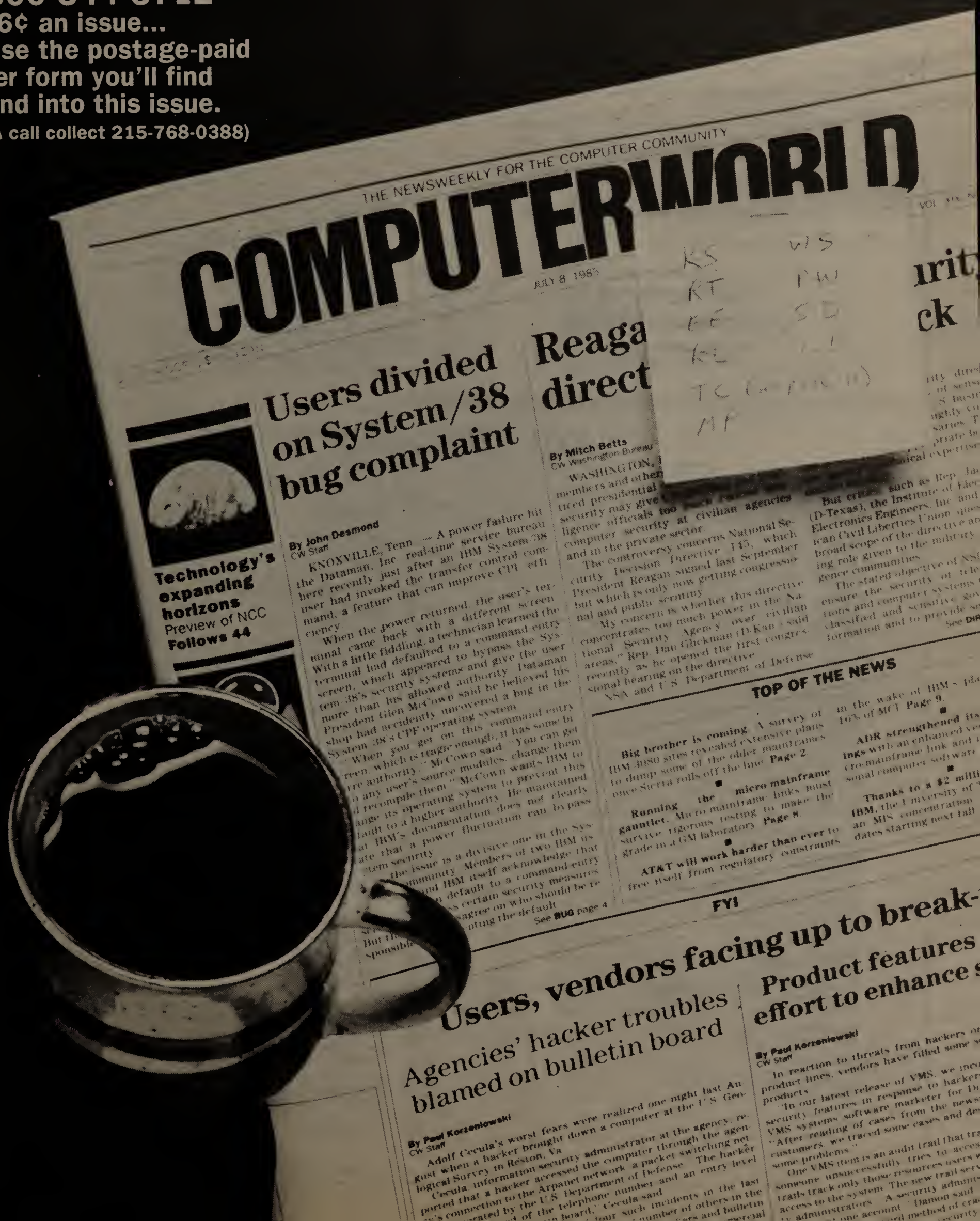
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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
JULY 8, 1985

Users divided on System/38 bug complaint

By John Desmond
CW Staff

KNOXVILLE, Tenn. — A power failure hit the Dataman, Inc. real-time service bureau here recently just after an IBM System/38 user had invoked the transfer control command, a feature that can improve CPU efficiency.

When the power returned, the user's terminal came back with a different screen. With a little fiddling, a technician learned the terminal had defaulted to a command-entry screen, which appeared to give the user more than his allowed authority. Dataman President Glen McCown said he believed his shop had accidentally uncovered a bug in the System/38's CPF operating system.

"When you get on this command entry screen, which is tragic enough, it has some bit of authority," McCown said. "You can get to any user's source modules, change them and recompile them." McCown wants IBM to change its operating system to prevent this fault to a higher authority. He maintained that IBM's documentation does not clearly state that a power fluctuation can bypass system security.

The issue is a divisive one in the System/38 community. Members of two IBM user groups and IBM itself acknowledge that the default to a command-entry screen is a security measure. Some agree on who should be responsible for the default.

Reagan direct

By Mitch Betts
CW Washington Bureau

WASHINGTON, I.D. — Members and other intelligence officials too security may give computer security at civilian agencies and in the private sector.

The controversy concerns National Security Decision Directive 115, which President Reagan signed last September but which is only now getting congressional and public scrutiny.

"My concern is whether this directive concentrates too much power in the National Security Agency over civilian areas," Rep. Dan Glickman (D-Kan.) said recently as he opened the first congressional hearing on the directive.

NSA and U.S. Department of Defense

Technology's
expanding
horizons
Preview of NCC
Follows 44

TOP OF THE NEWS

Big brother is coming. A survey of IBM 3080 sites revealed extensive plans to dump some of the older mainframes once Sierra rolls off the line. Page 2.

Running the micro mainframe gauntlet. Micro mainframe links must survive rigorous testing to make the grade in a GM laboratory. Page 8.

AT&T will work harder than ever to free itself from regulatory constraints.

FYI

Users, vendors facing up to break- Agencies' hacker troubles blamed on bulletin board

By Paul Korzeniewski
CW Staff

Adolf Cecula's worst fears were realized one night last August when a hacker brought down a computer at the U.S. Geological Survey in Reston, Va.

Cecula, information security administrator at the agency, reported that a hacker accessed the computer through the agency's connection to the Arpanet network, a packet switching network operated by the U.S. Department of Defense. The hacker was connected to the U.S. telephone number and an entry level of the board. Cecula said four such incidents in the last year.

By Paul Korzeniewski
CW Staff

In reaction to threats from hackers on product lines, vendors have filled some security holes.

"In our latest release of VMS, we incorporated security features in response to hacker attacks," said a security software marketer for Digital Equipment Corporation.

"After reading of cases from the news, some problems," we traced some cases and determined some problems.

One VMS item is an audit trail that tracks someone unsuccessfully tries to access the system. The new trail service tracks only those resources users want access to the system. A security administrator can set up an account. Damon said one method of cracking security.

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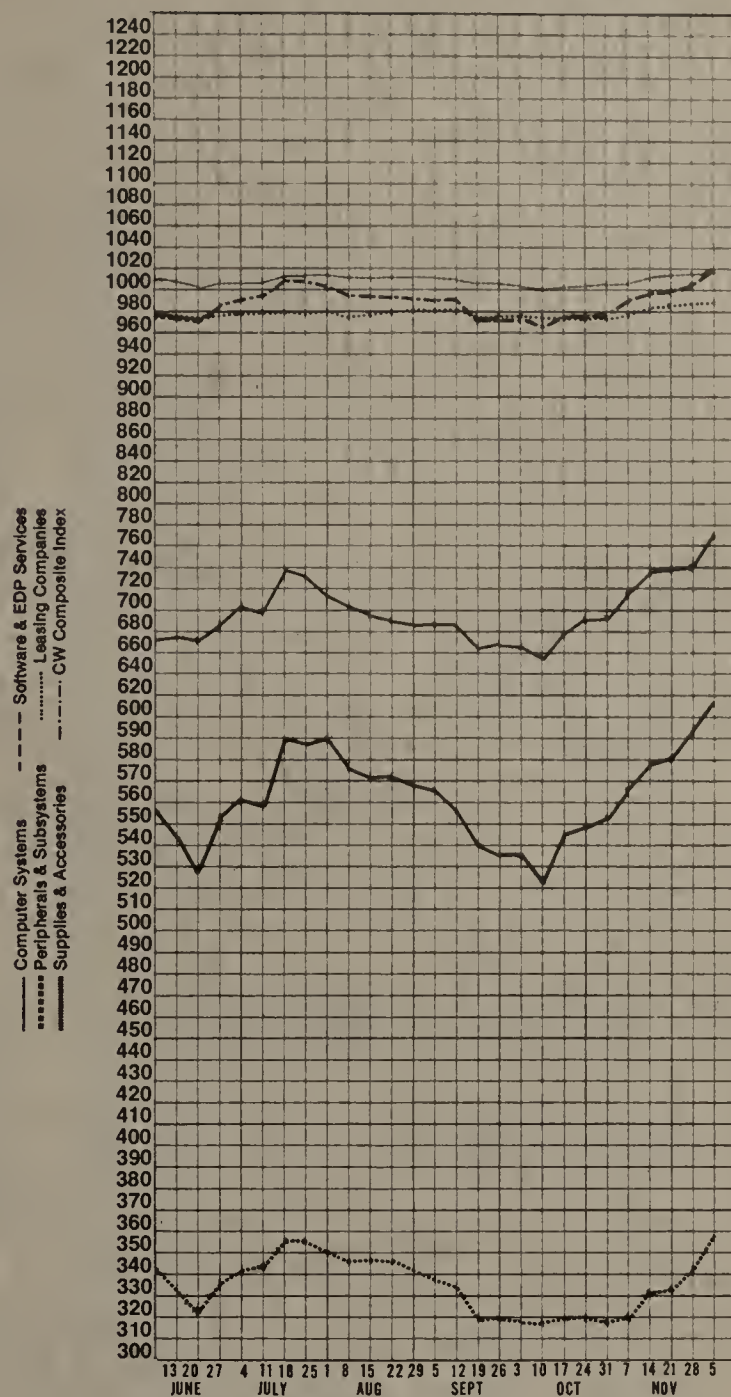
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Computerworld Stock Trading Index

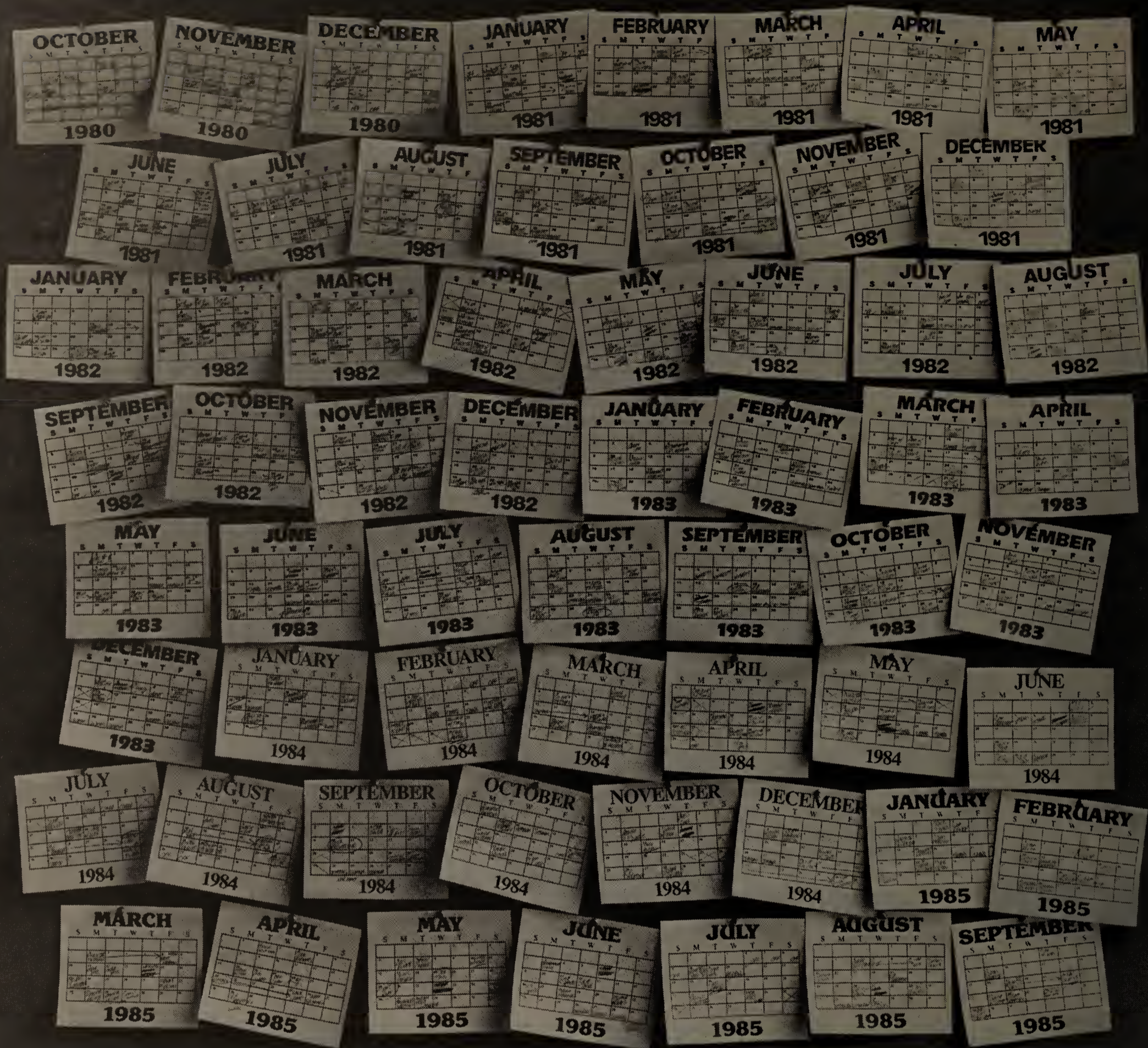


Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, DECEMBER 4, 1985

All statistics compiled
computed and formatted
by
TRADE QUOTES INC.
Cambridge, Mass. 02149

COMPUTER SYSTEMS						SOFTWARE & EDP SERVICES						PERIPHERALS & SUBSYSTEMS					
SYMBOL	1985 RANGE	CLOSE	WEEK CHNGE	WEEK PCT	WEEK CHNGE	SYMBOL	1985 RANGE	CLOSE	WEEK CHNGE	WEEK PCT	WEEK CHNGE	SYMBOL	1985 RANGE	CLOSE	WEEK CHNGE	WEEK PCT	WEEK CHNGE
Q ALPHA MICROSYSTEMS	5-12	5 1/2	+1/8	+2.3		O ADVANCED COMP TECH	2-4	4	-1/4	-5.8		P AM INTERNATIONAL	3-9	5 1/8	+1/4	+5.1	
O ALTOS COMPUTER SYST	7-14	12 3/4	+3/4	+6.2		N ADVANCED SYSTEMS INC	9-20	15 1/4	-1/8	-4.6		A ANDERSON JACOBSON	2-11	2 3/8	-1/2	-17.3	
A AMDAHL CORP	10-19	13 1/4	+1/4	+1.9		N AGS COMPUTERS INC	10-19	17 7/8	-7/8	-4.6		O AST RESEARCH INC	7-30	20 1/8	+5/8	+22.9	
O APPLE COMPUTER INC	14-31	20 1/2	+1 1/8	+5.8		O AMERICAN SOFTWARE	7-15	11 1/4	+3/4	-7.1		O AUTO-TROL TECHNOLOGY	4-15	4	0	0.0	
O APOLLO COMPUTER	9-31	14 1/4	+1 3/4	+14.0		N ANADOP INC	1-4	3 1/8	0	0.0		O AVANT-GARDE COMPUTING	5-26	5 1/8	-3/8	-6.8	
N AT&T	18-25	24	+5/8	+2.6		O ANALYSTS INTL CORP	5-11	8 1/4	-1 1/4	-3.1		O BANCTEC INC	5-12	8 5/8	+3/8	+4.5	
N BURROUGHS CORP	51-66	59 7/8	+7/8	+1.4		N APPLIED DATA RES	17-40	32	+3/8	+1.1		O BEEHIVE INT'L	1-2	1/4	+1/8	+100.0	
O COMPAQ COMPUTER CP	4-14	13 3/4	+1 3/4	+14.5		O ASHTON TATE	6-18	17 7/8	+1/4	-2.4		N BOLT, BERANEK & NEW	19-36	35 5/8	+3/8	+10.4	
D COMPUTER AUTOMATION	2-9	1 3/4	-7/8	-34.8		O ASK COMPUTER SYSTEMS	8-24	12 1/4	+1 1/8	+0.1		O CAMBEX CORP	1-3	7/8	0	0.0	
A COMPUTER CONSOLES	5-20	7 1/4	+3/8	+5.4		B ASTRAVINE COMP IND	1-7	1 5/8	-1/8	-7.1		N CENTRONICS DATA COMP	3-12	4 5/8	0	0.0	
N CONTROL DATA CORP	16-38	18 7/8	+3/4	+4.1		N AUTOMATIC DATA PROC	35-58	58 1/2	+1 3/4	+3.0		A CETEC CORP	8-10	7 1/8	-1/4	-3.3	
O CONVERGENT TECHNOL	5-17	11 3/4	+1 1/8	+10.5		O COMPUTER ASSOC INT'L	16-30	27 1/4	-1 1/4	-4.3		A COGNITRONICS	4-7	3 3/4	-1/4	-6.2	
O CPT CORP	5-12	5 7/8	-1/4	-4.0		O COMPUTER HORIZONS	5-13	14 3/8	-1/8	-0.8							
N CRAY RESEARCH INC	23-68	68 1/8	+1 1/4	+1.8		O COMPUTER NETWORK	5-10	6	0	0.0							
O DAISY SYSTEMS CORP	21-38	30	+5	+20.0		N COMPUTER SCIENCES	12-28	28 1/8	+1/8	+0.4							
N DATA GENERAL CORP	31-76	46	+3 1/4	+7.8		O COMPUTER TASK GROUP	10-23	20 3/4	+1 3/4	-7.7							
N DATAPoint CORP	5-23	5 1/4	0	0.0		O COMPUTER USAGE	1-3	1 1/2	-1/8	-7.6							
N DIGITAL EQUIPMENT	85-126	124 5/8	+6 1/8	+5.1		O COMPUTONE SYSTEMS	4-11	4 1/8	-1/4	-5.7							
A EECO INC	12-16	15 3/8	-1/4	-1.5		O CONSERV CORP	1-6	2 7/8	+3/8	+15.0							
N ELECTRONIC ASBCC	3-6	4 7/8	0	0.0		O COMSHARE	6-12	11 5/8	+1/8	+1.0							
LEASING COMPANIES						SUPPLIES & ACCESSORIES						SUPPLIES & ACCESSORIES					
N COMDISCO INC	8-24	23 1/2	+1 1/8	+5.0		N COMPUGRAPHIC CORP	24-37	27 3/4	+1	+3.7		N AMERICAN BUS PRODS	21-31	31 3/8	+5/8	+2.0	
N CONTINENTAL INFO SYS	5-15	14 3/8	0	0.0		O COMPUTER TRANSCIVER	1-4	5/8	-	-4.6		N BARRY WRIGHT	17-33	19 3/8	+3/8	+1.8	
O FINALCO GROUP INC	3-7	3 5/8	0	0.0		N COMPUVISION CORP	10-46	12 7/8	+2 3/8	+22.8		A DUPLEX PRODUCTS INC	12-21	20 3/4	+2 3/8	+12.8	
O PHOENIX AMERICAN INC	2-8	3 1/8	-1/8	-3.8		N CONRAC CORP	13-16	14 5/8	0	0.0		N ENNIS BUS. FORMS	10-23	23 1/4	+2 3/4	+13.4	
O SELECTRA INC	7-14	7	+1/4	+3.7		A DATAPRODUCTS CORP	11-24	15 7/8	+1 7/8	+13.3		N 3M COMPANY	74-86	86	+3 1/2	+4.2	
N U.S. LEASING	32-43	35 3/4	-3/8	-1.0		A DATARAM CORP	3-9	8 3/8	-1/8	-1.4		N MOORE CORP LTD	13-22	20 3/8	+1/4	+1.2	
COMPONENTS						O DATA SWITCH CORP	4-9	6	+3/4	+14.2		O STANDARD REGISTER	18-49	35 1/4	-1	-2.7	
N ADVANCED MICRO DEV	23-41	28 1/2	+2 3/4	+10.2		O DATUM INC	5-9	5 1/8	-1/4	-4.6		N WALLACE COMP SERVICE	28-40	38 7/8	+7/8	+2.3	
O ADV'D SEMICONDUCTOR	8-25	9 1/8	-1/8	-1.3		O DECISION DATA COMPUT	9-19	12 1/2	+1 5/8	+14.8							
N ANALOG DEVICES INC	16-26	25 5/8	+3/4	+3.0		O ENDATA INC	3-25	3 1/4	+1/8	+4.0							
O ANALOGIC CORP	9-16	12 7/8	-3/8	-2.8		O EVANS & SUTHERLAND	6-21	21	+1 3/4	+9.0							
N APPLIED MAGNETICS CP	8-16	15 1/2	+7/8	+5.9		O GANDARF TECHNOLOGIES	5-20	7 1/2	+1/4	+3.4							
O HADCO CORP	3-10	6 5/8	+1 1/8	+20.4		N GEN'L DATA COMM IND	8-35	12 1/8	+1/4	+2.1							
O MICRO MARK INC	6-14	8 1/8	+1/8	+2.0		N HAZELTINE CORP	3-28	25 7/8	+3	+13.1							
N TERADYNE	18-35	23 1/4	+1 1/4	+5.6		O ICOT CORP	6-17	7 1/8	-1/4	-3.3							



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